

**Advanced Cleaning
Product
Formulations
Volume 4**

Ernest W. Flick

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**ADVANCED CLEANING
PRODUCT FORMULATIONS**

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CLEANING
PRODUCT
FORMULATIONS**

Volume 4

Ernest W. Flick



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To
Ernie and Jeanne
and
Allyn and Barbara
and
Chris and Rachel

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Preface

This book (Volume 4) presents more than 435 up-to-date advanced cleaning product formulations for household, industrial and automotive applications. It is the result of information received from numerous industrial companies and other organizations. The data represent selections made at no cost to, nor influence from, the makers or distributors of these materials. Only the most recent formulas have been included. All formulations are completely different than those contained in Volumes 1, 2 and 3 published earlier.

Formulation in the cleaning product industry has gradually been undergoing significant change during the past years. Raw materials costs have risen and manufacturers have been reluctant to pass along these increases. Environmental considerations have also played a part. By changing formulations to improve cost/performance characteristics, manufacturers have been able to control costs but still enhance performance. This book presents manufacturers' suggested formulations which might meet new performance criteria.

The formulations in this book are divided into the following sections and chapters, with the number of formulations indicated in ():

- I. Household and Industrial Cleaners and Polishes
 1. Bathroom Cleaners (26)
 2. Dairy, Food and General Industrial Cleaners (15)
 3. Degreasers (5)
 4. Dishwashing Detergents (47)
 5. General Purpose Cleaners (34)
 6. Glass Cleaners/Polishes (25)
 7. Hard Surface Cleaners (44)
 8. Laundry Products (65)
 9. Metal Cleaners and Polishes (22)
 10. Oven, Grill and Hot Plate Cleaners (3)
 11. Polishes, Coatings and Finishes (30)
 12. Rinse Aids (4)
 13. Rug, Floor, Carpet, Upholstery Shampoos and Cleaners (32)
 14. Miscellaneous (32)

- II. Transportation Cleaners and Polishes
 - 15. Auto Cleaners and Polishes (14)
 - 16. Car and Truck Wash Compounds (27)
 - 17. Whitewall Tire Cleaners (4)
 - 18. Miscellaneous (8)

Each formula is located in the chapter which is most applicable. The reader, seeking a formula for a specific end use, should check each chapter which could possibly apply. In addition to the above, there are two other sections which will be helpful to the reader.

- III. A chemical trademark section where each tradenamed raw material included in the book is listed with a chemical description and the supplier's name. The specifications which each raw material meets are included, if applicable.
- IV. Main office addresses of the suppliers of trademarked raw materials.

Each formulation in the book lists the following information, as available, in the manufacturer's own words:

- Description of end use and most outstanding properties.
- The percent by weight or volume of each raw material included in the formula, rounded to a decimal figure.
- Key properties of the formula, which are the features that the source considers to be more outstanding than other formulations of the same type.
- The formula source, which is the company or organization that supplied the formula. The secondary source may be the originating company and/or the primary source's publication title, or both. A formula number is included, if applicable.

The table of contents is organized in such a way as to serve as a subject index.

My fullest appreciation is expressed to the companies and organizations who supplied the original starting formulations included in this book. I also thank the suppliers of the raw materials included in these formulations, who furnished information describing their trademarked raw materials.

Newburyport, Massachusetts
August 1996

Ernest W. Flick

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Section I

Household and Industrial Cleaners and Polishes

1. Bathroom Cleaners

Bathtub and Faucet Cleaner

<u>Ingredient:</u>	<u>Percent by Weight</u>
Liquid Citric Acid-50% (Haarman & Reimer Corp.)	20.0
Ammonium hydroxide solution 28%	3.2
Cellosolve solvent	5.0
Nonionic surfactant (Neodol 25-9)	6.0
Water	65.8
Fragrance, dye	q.s.

Mix the Liquid Citric Acid-50% with an equal volume of water. Slowly add the ammonium hydroxide solution. The neutralization should be done cautiously and under agitation, as the reaction is exothermic. Add Cellosolve, surfactant, remaining water, fragrance and dye. The formula is suitable for a pump spray. Bathtub, sinks, faucets and other hard surfaces should be sprayed from a distance of about 10 inches. For maximum effectiveness, the deposited cleaner fluid should be left at work for at least five minutes and then rinsed off with water or removed with a wet cloth or sponge.

SOURCE: Haarman & Reimer Corp.: Suggested Formulation

Bathroom Cleaner

	<u>Wt%</u>
Water	79
Sodium Citrate	9
Glucopon 425 CS	9
Propylene Glycol nButyl Ether	3

Toilet Bowl Cleaner

	<u>Wt%</u>
Water	79
Phosphoric Acid	15
Glucopon 425 CS	6

Tub & Tile Cleaner

	<u>Wt%</u>
Water	75
Sodium Citrate	4
STPP	1
Standapol ES-2	12
Velvetex AB-45	4
Standamid KD	1
Isopropyl Alcohol	3

SOURCE: Henkel Corp., CD Division: Starting Formulations

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Clear Liquid Bowl Cleaner

Formula BC-0001

	<u>Wt. %</u>
Miranol FBS	3.0
Hydrochloric Acid (20Be)	20.0
Water	77.0

Procedure

Add the water. Slowly add the hydrochloric acid, with mixing. Add the Miranol FBS. Mix until uniform.

Physical Properties

Appearance: Clear, light yellow
Viscosity: <10 cps
Specific Gravity: 1.03
pH (as is): <1.0

Thick Toilet Bowl Cleaner

Formula BC-0002

	<u>Wt. %</u>
Mirataine TM	5.0
Hydrochloric Acid (20Be)	32.0
Water	Q.S.

Procedure

Add the hydrochloric acid to the water, with stirring. Slowly add the Mirataine TM and mix until uniform.

Physical Properties

Appearance: Clear, yellow liquid
Viscosity: 1.035 cps
Specific Gravity: 1.037
pH (as is): <1.0

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Foamable Acid Tile Cleaner

Hard Foaming Hard Surface Cleaner for Soap Scum Removal

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	87.00
Citric Acid (50%)	10.00
Mazon 98	3.00

pH (as is): 2.0-2.5

Appearance: Clear, water-white liquid

Specific Gravity: 1.01

Procedure:

To a mixing vessel, charge the ingredients in the order listed above. Mix until clear.

Notes:

This formula produces a copious, dense foam. It is suitable for cleaning soap scum from shower stall tiles and other bathroom and household fixtures.

Formula CH-105

Liquid Toilet Bowl Cleaner

A Liquid Stain and Rust Remover

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	66.00
Phosphoric Acid (75%)	30.00
Avanel S-70	4.00

pH (as is): <1.5

Appearance: Clear, water-white liquid

Specific Gravity: 1.124

Procedure:

Charge the water to the mixing vessel, and slowly charge the phosphoric acid under agitation. Use caution during acid addition to avoid spattering. When all of the acid is dissolved, cool to room temperature and add the Avanel surfactant.

Notes:

This formulation is designed to be used "as is" and is particularly effective in the removal of scale build-up and rust stains.

This material may be marketed in an appropriate squeeze bottle to facilitate "under the rim" bowl cleaning by the consumer.

Formula CT-101

SOURCE: Mazer Chemicals: Suggested Formulations

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Solid Automatic Toilet Bowl Cleaner Formulation

<u>Ingredient:</u>	<u>%W/W</u>
Macol DNP 150	25.0
Incromide L90	25.0
Carbowax PEG 8000	20.0
Macol 27	20.0
Versaflex 207 (dry)	5.0
Water	5.0

Procedure:

1. Melt the Macol 27, Macol DNP 150, and Carbowax PEG 8000, and mix together.
2. Maintain a temperature of about 70C, and add the Incromide L90 while mixing.
3. Add water and Versaflex 207 (dry) and mix.
4. Pour formulation into a mold, and allow to cool.

SOURCE: National Starch and Chemical Co.: Reference #8069:49

Acid Toilet Bowl Cleaner

	<u>% by Weight</u>
Water, D.I.	71.0
Hydrochloric Acid (37%)	27.0
Rewoteric AM TEG	2.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 135

Solids: 1.0%

pH: 2.8

SOURCE: Witco Corp.: Formula 532

Tub, Tile and Bathroom Cleaner

	<u>% by Weight</u>
Water	81.5
Sodium Carbonate	5.0
Tetrasodium EDTA (40%)	10.0
Phosphoteric T-C6	1.5
Nonoxynol 10	2.0

Procedure:

Add ingredients in order listed, allowing sufficient time between additions.

This product may be applied with a trigger pump or by aerosol.

Formulation Properties:

Physical Appearance: Clear liquid

Cloud Point: 42C

SOURCE: Mona Industries, Inc.: Suggested Formulation

Tile, Porcelain and Bathroom Cleaner, Acid

	<u>% by Weight</u>
Water, D.I.	75.5
Rhodopol 23	0.5
Petro BAF Powder	2.0
Phosphoric Acid, 75%	12.0
Hydroxyacetic Acid, 70%	10.0
Perfume, Dye	q.s.

Blending Procedure:

Add Rhodopol 23 slowly to water with high speed mixing. Allow to mix until material thickens. Add remaining ingredients in order listed. If problems develop adding Rhodopol to water, premix the Rhodopol 23 in some isopropanol before adding to water.

Formula 529

Hypochlorite Tub and Tile Cleaner and Mildew Stain Remover

	<u>% by Weight</u>
Water, D.I.	44.9
Sodium Hydroxide (30%)	1.0
Varox 365	1.5
Sodium Hypochlorite (5.7%)	52.6

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 4

Solids: 3.8%

pH: 13.5

Formula 531

Soap Scum Remover/Cleaner

	<u>% by Weight</u>
Water, D.I.	q.s.
*Builder Solution	0.20
Tetrasodium EDTA	0.25
Rewoteric AM V	1.00
Dowanol EB	0.50

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Typical Properties:

Viscosity, cps: 4

Solids: 2.0%

pH: 11-12

Comments:

*Builder Solution: Sodium Carbonate (Na_2CO_3): 4%

Potassium Hydroxide (KOH): 3%

DI Water 93%

Formula 544

SOURCE: Witco Corp.: Suggested Formulations

8 *Advanced Cleaning Product Formulations*

Toilet Cleaner, Liquid-A

	%
Marlipal 013/99	3.0
Acetic acid*	6.0
Balance water, fragrance, dyestuff	to 100

Active matter: 2.7%

Toilet Cleaner, Liquid-B

	%
Marlipal 013/99	5.0
Citric acid	1.7
Balance water, fragrance, dyestuff	to 100

Active matter: 4.5%

Toilet Cleaner, Medium Viscosity-A

	%
Marlazin OL 2	1.5
Marlipal 013/99	0.5
Citric acid	5.0
Na Cumene sulphonate 40 (approx.)	1.5
Balance water, fragrance, dyestuff	to 100

Active matter: 2.0%

Toilet Cleaner, Medium Viscosity-B

	%
Marlazin OL2	1.5
Marlipal 013/99	0.5
Citric acid	2.5
Phosphoric acid, 85%	7.5
KNA cumene sulphonate 40 (approx.)	1.3
Balance water, fragrance, dyestuff	to 100

Active matter: 2.0

*further products of Huls AG

SOURCE: Huls America, Inc.: Basic Formulations of Detergents
and Cleaning Agents for Household Purposes

Toilet Cleaners, Medium Viscosity-A

	%
Marlazin 7102	4.0
Phosphoric acid, 85%	5.0
Sodium chloride	3.5
Balance water, fragrance, dyestuff	to 100

Active matter: 4.0%

Toilet Cleaner, Medium Viscosity-B

	%
Marlazin OL 2	3.0
Marlipal 013/99	0.5
Acetic Acid*	6.0
KNA cumene sulphonate 40 (approx.)	3.1
Balance water, fragrance, dyestuff	to 100

Active matter: 3.5%

Toilet Cleaner, Powder

	%
Marlon ARL	5.0
Amidosulphonic acid	20.0
Magnesium carbonate	5.0
Sodium bisulphate	60.0
Sodium bicarbonate, fragrance, dyestuff	to 100

Active matter: 4.0%

Toilet Cleaner, Powder-B

	%
Marlon A 390	5.0
Citric acid	25.0
Sodium sulphate	55.0
Sodium bicarbonate, fragrance, dyestuff	to 100

Active matter: 4.5%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

10 Advanced Cleaning Product Formulations

Toilet Cleaning Block, Extruded-A

	%
Marlon ARL	40.0
Marlipal 1618/25 powder	4.0
Marlamid M1618	6.0
Vestinol C*	4.0
Sodium sulphate, dyestuff	to 100

Active matter: 42.0%

Toilet Cleaning Block, Extruded-B

	%
Marlon ARL	40.0
Marlon A390	30.0
Lipoxol 6000*	8.0
Sodium tripolyphosphate	1.0
Fragrance	5.0
Sodium sulphate, dyestuff	to 100

Active matter: 59.0%

Toilet Cleaning Block, Cast-A

	%
Marlinat 242/70	3.0
Marlon A375	13.0
Marlipal 1618/25 powder	30.0
Marlipal 1618/40	24.0
Marlamid M 1618	15.0
Lipoxol 12000*	10.0
Fragrance	4.0
Dyestuff	1.0

Active matter: 80.8%

Toilet Cleaning Block, Cast-B

	%
Marlipal 013/90	12.0
Marlipal 1618/40	60.0
Marlipal M 1618	10.0
Lipoxol 12000*	13.0
Fragrance	4.0
Dyestuff	1.0

Active matter: 79.0%

*further products of Huls Ag

SOURCE: Huls Chemical Co.: Basic Formulations of Detergents and Cleaning Agents for Household Products

2. Dairy, Food and General Industrial Cleaners

Dairy Milkstone Remover
An Acid Dilutable Concentrate

<u>Ingredient:</u>	<u>Wt.%</u>
Deionized Water	53.40
Glycolic Acid (70%)	28.60
Phosphoric Acid (85%)	10.00
Avanel S-150	8.00

pH (as is): <2.0

Appearance: Clear, water-white to light-yellow liquid

Procedure:

Charge water to the mixing vessel and start agitation. Under agitation, charge the Glycolic Acid followed by the Phosphoric Acid. Charge the Phosphoric Acid slowly to avoid splattering. Charge the Avanel S-150 and cool to room temperature. Fill off.

Notes:

This formulation is highly effective at removing dairy milkstone from dairy equipment.

Use concentration is 1/2 to 1 ounce per gallon of water.

Brush thoroughly, then rinse.

Formula CD-101

Dairy Milkstone Remover
Low Cost Acid Dilutable Concentrate

<u>Ingredient:</u>	<u>Wt.%</u>
Deionized Water	55.00
Phosphoric Acid (85%)	37.50
Gluconic Acid (50%)	3.50
Avanel S-70	4.00

pH (as is): <2.0

Appearance: Clear, water-white liquid

Procedure:

To mixing vessel, charge the water and start agitation. Slowly charge the Phosphoric Acid to avoid splattering. Cool to room temperature and charge the Gluconic Acid and Avanel S-70.

Notes:

A lower cost substitute for PPG/Mazers CD-101 dairy cleaner formulation. It retains the general performance attributes of the original formulation.

Use concentration is 1/2 to 1 ounce per gallon of water.

Brush thoroughly, then rinse.

Formula CD-102

SOURCE: Mazer Chemicals: Suggested Formulations

Dairy Pipeline Cleaner
High Alkaline Low Foam Hypochlorite Cleaner

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	52.00
Sodium Hydroxide (50%)	20.00
Avanel S-74	2.50
Sodium Cumene Sulfonate (40%)	1.50
Sodium Hypochlorite (12.5%)	24.00

pH (as is): 12.5-13.5

Appearance: Clear, light-yellow liquid

Specific Gravity: 1.15

Procedure:

Charge water to mixing vessel and start agitation. Add Sodium Hydroxide, and cool to less than 90F. Add the Avanel S-74 and Sodium Cumene Sulfonate. Mix until clear and add the Sodium Hypochlorite.

Notes:

This formulation combines a chlorine cleaner with the high alkalinity of common pipeline cleaners resulting in a single cleaning system.

Shelf stability of hypochlorite cleaners is dependent on the absence of trace metals. Care should be taken to insure good quality water and hypochlorite.

Formula may be adjusted to use other commercially available concentrations of Sodium Hypochlorite. Absolute concentration of available chlorine is 3.0%.

SOURCE: Mazer Chemicals: Formulation CD-103

Institutional Stainless Steel Cleaner

<u>Components:</u>	<u>% by Weight</u>
Water	52.75
50% Citric Acid	20.00
Burcosperse LP	5.00
Dequest 2000*	5.00
Burco NPS 50%	5.00
45% KOH	12.25

*From Monsanto or use equivalent product.

Procedure:

Add components in the order listed. Blend until uniform between each addition.

SOURCE: Burlington Chemical Co., Inc.: Suggested Formulation

High Pressure Cleaner for Industrial Use
Liquid, transparent, alkaline

Ingredients:

A	Genapol UD-050	2,50%
	Genapol UD-080	2,50%
	Genapur ASA	3,00%
	KOH (85%)	5,00%
B	Water (ca.50C)	67,00%
C	Sodiummetasilicate x 5H ₂ O	10,00%
	Aquamollin BC Powder highly conc.	10,00%

Manufacturing:

- I The components of A are mixed.
- II Then B is added.
- III Finally the components of C are added.

Cleaner for Milking Equipment
Liquid

Ingredients:

A	Tetrapotassiumpyrophosphate	7,00%
	Sodiummetasilicate x 5H ₂ O	5,00%
	Sodiumcarbonate	3,00%
B	Water	70,00%
C	Genapur ASA	5,00%
	KOH (85%)	5,00%
D	Genapol UD - 080	5,00%

Manufacturing:

- I One after another, the components of A are added to B.
- II Stir one after another, the components of C to I.
- III At last D is added.

Cleaner for Meat Plants
Liquid

Ingredients:

A	Tetrapotassiumpyrophosphate	5,00%
	Potassium water glas (40 Be)	2,00%
B	Water	76,00%
C	Genapur ASA	3,50%
	KOH (85%)	3,50%
D	Hostapur SAS 60	5,00%
	Genapol UD - 080	2,00%
	Solvent GX 5	3,00%

Manufacturing:

- I Add one after another, the components of A to B.
- II C is added to I by continuing stirring.
- III At last the components of D are added.

SOURCE: Hoechst Aktiengesellschaft: Detergents and Cleaning Agents: Guide Formulations

Meat Packaging Plant Cleaner Concentrate
An Alkaline High Foaming Hypochlorite Hard Surface Cleaner
with Improved Salt Tolerance

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	59.20
Hostapur SAS-60	2.50
Potassium Hydroxide	0.90
Tetrapotassium Pyrophosphate	2.10
Mazon 98	5.00
Sodium Cumene Sulfonate (40%)	1.30
Sodium Hypochlorite (12.5%)	10.00
Deionized Water	19.00

pH (as is): 12.5-13.5

Appearance: Clear-to-translucent, slightly viscous, light-yellow liquid.

Specific Gravity: 1.04

Procedure:

Charge the water to a mixing vessel and start agitation. Charge the Hostapur, followed by the Potassium Hydroxide and the Tetrapotassium Pyrophosphate. Apply cooling and then add the Mazon 98 and the Sodium Cumene Sulfonate. When product is less than 85 degrees F, add the Sodium Hypochlorite and the balance of the water.

Notes:

This formula is designed to be diluted to 3-6 ounces per gallon in hot water and to be applied as a foam to meat packing house walls and other surfaces. After an appropriate time, these surfaces should be thoroughly rinsed.

Shelf stability of chlorine cleansers is dependent upon the absence of trace metals. Care should be taken to insure good quality water and Sodium Hypochlorite.

Revision of CB-102 to provide greater salt tolerance.

SOURCE: PPG Industries, Inc.: Formula CB-102-A

Steam Cleaners
Cleaner-Light Duty

<u>Ingredients:</u>	<u>% by Weight</u>
Sodium Metasilicate	30.0
Sodium Tripolyphosphate	58.0
Trisodium Phosphate	10.0
Aerosol 22 Surfactant	1.0
Triton CF-10	1.0

Cleaner-Medium Duty

<u>Ingredients:</u>	<u>% by Weight</u>
Sodium Orthosilicate	33.0
Sodium Carbonate	20.0
Trisodium Phosphate	44.0
Aerosol 22 Surfactant	1.5
Triton CF-10	1.5

Cleaner-Heavy Duty (For Oily Soils)

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol 22 Surfactant	7.0
Sodium Metasilicate	35.0
Dowanol DE	3.0
Water	55.0

Cleaner-General Purpose

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OS Surfactant	10.0
Soda Ash	35.0
Sodium Hydroxide	15.0
Sodium Metasilicate (5H ₂ O)	30.0
Sodium Tripolyphosphate	10.0

Use 0.5 to 2.0 oz. to 1 gallon of water.

Cleaner-Light Duty for Soft Metals

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OS Surfactant	7.14
Sodium Sesquicarbonate	92.86

Cleaner-General Purpose

<u>Ingredients:</u>	<u>% by Weight</u>
Sodium Metasilicate	15-20
Aerosol OS Surfactant	2- 3
Aerosol 22 Surfactant	5.0
Water	73-78

Cleaner-Compound

<u>Ingredients:</u>	<u>% by Weight</u>
Sodium Hydroxide	30.0
Borax	30.0
Soda Ash	20.0
Disodium Phosphate	15.0
Aerosol C-61 Surfactant	5.0

Add the desired amount of cleaner to water which has been preheated to 140F.

SOURCE: Cytec Industries Inc.: Suggested Formulations

3. Degreasers

d-Limonene Microemulsion Cleaner/Degreaser

Burco TME	11 parts
Burco FAE	11 parts
d-Limonene	16 parts
Water	62 parts

Mix in order listed; add water slowly. Product will thicken, then break as water is added.

No co-solvent is required when mixed in proportions given above. Produces a clear product. Burco FAE imparts corrosion resistance in addition to emulsion characteristics.

To make a more concentrated product, less water can be used, but ratios of the other actives must remain similar to the above. Example:

TME	22 parts
FAE	22 parts
d-Limonene	32 parts
Water	24 parts

High active products can reach a gel-like viscosity, but can be thinned with Isopropanol and Butyl Propylsolv.

SOURCE: Burlington Chemical Co., Inc.: Suggested Formulation

Concentrated d-Limonene Biodegradable Degreaser

A Natural All-Purpose Micro-Emulsion Cleaner or Concentrate

<u>Ingredient:</u>	<u>Wt. %</u>
d-Limonene, Grade M	30.00
Mazclean EP	20.00
Deionized Water	50.00

pH (as is): 9.0-10.0

Appearance: Clear, light-yellow liquid

Specific Gravity: 0.97

Odor: Sweet Orange

Procedure:

Charge the d-Limonene and Mazon 245-103 to an appropriate mixing vessel and start agitation. Under good agitation, slowly add the water and mix until solution is clear.

Notes:

This formulation may be used "as is" or diluted. For heavy-duty use, product should be sprayed "as is" onto the oily substrate, followed by a water rinse.

SOURCE: PPG Industries, Inc.: Formulation CS-101

Solvent Degreasing

The solubility of Aerosol OT Surfactant is extremely high in all solvents used for degreasing. It will dissolve easily at room temperature in most cases. If heating is required for solubilization, the solution will be stable upon return to room temperature.

As an example, Aerosol OT-75% is soluble to over 50% at room temperature in carbon tetrachloride, but naphtha solvent requires heating. Both are clear solutions at room temperature. The presence of the water in Aerosol OT-75% portion is an aid in the removal of any water-soluble particles present in the work being degreased.

Formulations such as:

Aerosol GPG or OT-75%	0.5%
High Flash Naphtha	99.5%

can be used for light-duty cleaning, the solvent removing the oils, waxes, etc. and the Aerosol OT aiding not only in the penetration of the covering material, but also in draining. This type of cleaner can be sprayed on, brushed on, or the work can be immersed into it followed by a rinse.

Heavy-Duty Degreasing:

To remove heavy lubricating and preservative oils and greases, many solvents may be used to specific needs. Aerosol GPG Surfactant will be found to be soluble in all of these solvents. A typical formulation used is:

Aerosol GPG or OT-75%	1- 3%
Kerosene	97-99%

Preparation is by simple mixing. Tri- or tetrachloroethylene, high flash naphtha or other suitable solvents can be substituted for the kerosene.

Carbonaceous deposits can be removed by dipping in formulations such as:

Kerosene	40%
Perchloroethylene	30%
Carbon Tetrachloride	16%
Cresylic Acid	10%
Aerosol GPG or OT-75%	4%

Normally, 3 gallons of the above are added to 1 gallon of water which, floating on the surface, minimizes loss of solvent. The work to be cleaned is immersed in the solvent phase for time periods of a few minutes to several hours, if required, to obtain cleanliness. Upon removal from the solvent layer, and a short rinse in the aqueous layer, the cleaned articles are rinsed, dried or carried onto the next operation.

SOURCE: Cytec Industries, Inc.: Suggested Formulations

4. Dishwashing Detergents

Clear Liquid Dishwash

	<u>% by Weight</u>
Witcolate AE-3	12.5
Witco 1298 Soft Acid	19.0
Sodium Hydroxide, 50%	5.2
Witconate SXS Liquid	13.5
Witcamide 5195	2.5
Phosphoric Acid	q.s. to pH = 6.4-6.8
Water	q.s. to 100

Blending Procedure

Blend ingredients in the order shown, mixing thoroughly between each addition.

Formula 108

Non-Chlorinated Machine Dishwashing Compound, Liquid

	<u>% by Weight</u>
Water, D.I.	79.5
Sodium Tripolyphosphate	2.0
Versene 220, Powder	1.0
Sodium Gluconate	1.0
Sodium Metasilicate, Pentahydrate	7.0
Caustic Soda 50%	8.5
Petro ULF Liquid	1.0

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Formula 109

Clear, Colorless Manual Dish Wash

	<u>% by Weight</u>
Water, D.I.	57.5
Witcolate ES-3	31.2
Rewoteric AM B-14	5.0
Ethanol	3.0
Sodium Chloride	3.3

Blending Procedure:

Blend ingredients in the order listed. Dissolve completely between each addition.

Comment:

Rewoteric AM B-14: Grease cutter and foam booster.

Formula 132

SOURCE: Witco Corp.: Suggested Formulations

Dish Washing Agent

Clear, liquid, 25% WAS

Alkanesulphonate:ethersulfate=4.1

Ingredients:

A	Hostapur SAS 60	33.30%
	Genapol ZRO liquid	17.90%
B	Water	47.50%
	Preservative	0.10%
	Dye	q.s.
	Perfume	0.20%
	Hoe S 3924	1.00%

Manufacturing:

One after another, the components of B are added to A.

Tests:

Viscosity (mPas): 90

Cloud point: <-5C

Dish Washing Agent

clear, liquid, 25% WAS

alkanesulphonate:ethersulphate=4.1

Ingredients:

A	Hostapur SAS 60	33.30%
	Genapol ZRO liquid	17.90%
B	Water	44.50%
	Preservative	0.10%
	Dye	q.s.
	Perfume	0.20%
	Hoe S 3924	4.00%

Manufacturing:

One after another, the components of B are added to A.

Tests

Viscosity (mPas): 410

Cloud point: <-5C

Dish Washing Agent

Clear, liquid, 30% WAS

alkanesulphonate:ethersulphate=4.1

Ingredients:

A	Hostapur SAS 60	40.00%
	Genapol ZRO liquid	21.40%
B	Water	38.30%
	Preservative	0.10%
	Dye	q.s.
	Perfume	0.20%

Manufacturing:

One after another, the components of B are added to A.

Tests:

Viscosity (mPas): 330

Cloud point: <-5C

SOURCE: Hoechst Aktiengesellschaft: Detergents and Cleaningal
Agents: Guide Formulations

Dish Washing Agent
 Clear, liquid, 30% WAS
 alkanesulphonate:ethersulphate=4:1

Ingredients:

A	Hostapur SAS 60	40.00%
	Genapol ZRO liquid	21.40%
B	Water	34.30%
	Preservative	0.10%
	Dye	q.s.
	Perfume	0.20%
	Hoe S 3924	4.00%

Manufacturing:

One after another, the components of B are added to A.

Tests:

Viscosity (mPas): 610
 Cloud point: <-5C

Powder for Automatic Dishwashing Machines

Ingredients:

A	Genapol 2908	1.00%
B	Sodiummetasilicate x 5H ₂ O	52.00%
C	Sodiumcarbonate	10.00%
	Sodiumdichloroisocyanurate	2.00%
	Thermphos NW	35.00%

Manufacturing:

I Spray A on B.

II One after another, the components of C are added to I.

Application:

1-2 g detergent/L dishwashing liquor

SOURCE: Hoechst Aktiengesellschaft: Detergents and Cleaning Agents: Guide Formulations

Dishwashing Detergent, Medium Viscosity, Basis Marlon A-A

	%
Marlon A 350	30.0
Marlinat 242/70	5.7
Dionil OC	1.0
Na cumene sulphonate 40	1.0
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 20.0%

Dishwashing Detergent, Medium Viscosity, Basis Marlon A-B

	%
Marlon A 365	18.5
Marlinat 242/70	4.3
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 15.0%

Dishwashing Detergent, Medium Viscosity, Basis Marlon AS3-A

	%
Marlon AS3	10.5
Caustic soda, 50% (approx.)	2.6
Marlipal 013/120	2.7
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 14.0%

Dishwashing Detergent, Medium Viscosity, Basis Marlon AS3-B

	%
Marlon AS3	4.5
Caustic soda, 50% (approx.)	1.1
Marlinat 242/70	4.5
Balance water, fragrance, dyestuff, perservative, sodium chloride	to 100

Active matter: 8.0%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and
Cleaning Agents for Household Purposes

Dishwashing Detergent, Medium Viscosity, Basis Marlon PS-A

	%
Marlon PS 65	49.0
Marlinat 242/70	11.5
Marlamid DF 1218	3.0
Ethanol*	4.0
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 43.0%

Dishwashing Detergent, Medium Viscosity, Basis Marlon PS-B

	%
Marlon PF 40	71.3
Marlamid DF 1218	1.5
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 30.0%

* further products of Huls AG

Dishwashing Detergent, Medium Viscosity, Basis Marlon Compounds-A

	%
Marlon AFO 40	46.3
Marlamid D 1885	1.5
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 20.0%

Dishwashing Detergent, Medium Viscosity, Basis Marlon Compounds-B

	%
Marlon AFO 50	30.0
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 15.0%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and
Cleaning Agents for Household Purposes

Dishwashing Detergent, Powdered, Spray Mixing Process-A

	%
Marlox FK 64	1.0
Sodium tripolyphosphate	40.0
Sodium metasilicate pentahydrate	35.0
Sodium carbonate, dehydrated	22.0
Sodium dichloroisocyanurate	2.0
Active matter: 1.0%	
Application: Use 3-5 g/l water (depending on water hardness)	

Dishwashing Detergent, Powdered, Spray Mixing Process-B

	%
Marlox B 24/80	1.0
Sodium tripolyphosphate	25.0
Sodium metasilicate pentahydrate	25.0
Sodium metasilicate, dehydrated	20.0
Sodium carbonate, dehydrated	15.0
Sodium dichloroisocyanurate	2.0
Phosphonate HEDP, e.g. Sequion 10 Na 2	2.0
Sodium hydroxide	10.0
Active matter: 1.0	
Application: Use 3-5 g/l water (depending on water hardness)	

Dishwashing Detergent, Powder, Phosphate-Free, Spray Mixing Process-A

	%
Marlox MO 154	2.5
Sodium citrate dihydrate	35.0
Sodium disilicate granulate	25.0
Polycarboxylate, e.g. Sokalan PA 40 granulate	5.0
Sodium perborate monohydrate	15.0
Tetraacetylenethylenediamine (TAED)	4.0
Enzyme Esperase	2.0
Sodium sesquicarbonate	to 100
Active matter: 2.5%	

Dishwashing Detergents, Powder, Phosphate-Free, Spray Mixing Process-B

	%
Marlox MO 154	2.0
Sodium carbonate, dehydrated	15.0
Polycarboxylate, e.g. Permulsin SP	10.0
Phosphonate HEDP, e.g. Sequion 10 Na 2	5.0
Sodium metasilicate	to 100
Active matter: 2.0%	

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

Dishwashing Detergent (40% Solids)-A

	<u>% by Weight</u>
Witconate 1260 Slurry	37.0
Witcolate LES-60A	17.5
Witcamide 128T	4.0
Water	34.0

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Dishwashing Detergent (40% Solids)-B

	<u>% by Weight</u>
Witconate 45LX	59.0
Witconate SXS Liquid	6.0
Witcolate LES-60A	17.5
Witcamide 128T	4.0
Water	16.5

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Formula 105

Hand Dishwashing Liquid

	<u>% by Weight</u>
Witconate AOS	60.0
Witcolate S-1285C	10.0
Witcamide 128T	4.0
Water	26.0

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Formula 106

SOURCE: Witco Corp.: Suggested Formulations

Dish Wash w/Amine Oxide/LABS/SLES

	<u>% by Weight</u>
Water, D.I.	62.9
Witconate 30DS	13.7
Varox 1770	5.3
Witcolate SE-5	18.1

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition. Add Ethanol as needed to lower viscosity.

Typical Properties:

Viscosity, cps: 620

Solids: 16.8%

pH: 9.12

Formula 117

Dish Wash w/Amine Oxide/LABS/ALES

	<u>% by Weight</u>
Water, D.I.	70.0
Witconate 30DS	13.8
Varox 1770	3.1
Witcolate LES-60A	8.2
Ethanol	5.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition. Acidify with Citric Acid to pH = 6.5.

Typical Properties:

Viscosity, cps: 4

Solids: 10.1%

pH: 6.68

Formula 118

Dish Wash w/Amine Oxide/LABS

	<u>% by Weight</u>
Water, D.I.	69.8
Witconate 30DS	20.3
Varox 1770	4.9
Ethanol	5.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 4

Solids: 7.8%

pH: 9.16

Formula 119

SOURCE: Witco Corp.: Suggested Formulations

High-Performance Hand Dish Detergent
Formula DW-0013

	Wt. %
Water	To 100
SXS, 40	3.0
Caustic Soda, 50%	6.6
Dodecylbenzene sulfonic Acid	25.0
Rhodapex NA-61	8.0
Alkamide DC-212/S	3.0
Rhodacal A-246/L	10.0
Rhodasurf 25-9	6.0
Citric Acid (50%), to pH 8	Q.S.
Ethanol SD-3A	2.0
Preservative	0.1
Fragrance	-
Dye	-

Procedure

Add the ingredients in the order listed with mixing. Mix until uniform after each addition. Citric Acid and Caustic Soda are used for pH adjustment.

Physical Properties

Appearance: Clear gold liquid, dyed to preference
pH, as is: 8
Viscosity: 400 cps
Specific Gravity: 1.05

Mild Liquid Hand Dish Detergent

	Wt. %
Water	To 100
Caustic Soda (50%)	3
Dodecylbenzene sulfonic acid	12
Miranol CS Conc.	15
Alkamide DC-212/S	3
Rhodasurf 25-9	3
Cheelox BF-13	0.2
Citric Acid (50%), to pH 8	Q.S.
Fragrance	-
Dye	-

Procedure

Add the ingredients in the order listed with mixing. Mix until uniform after each addition. Citric acid and caustic soda are used for pH adjustment. Dissolve the dye in water before addition.

Physical Properties

Appearance: Clear gold liquid, dyed to preference
pH, as is: 8
Specific Gravity: 1.04
Viscosity: 150 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Starting Formulations for Home Machine Dishwashing Detergents
8.7% Phosphorous(A)

<u>Compounds:</u>	<u>% by Weight</u>
BASF Surfactant*	3
Sodium tripolyphosphate	34
Britesil H24 hydrous sodium silicate**	17
Sodium sulfate	15
Sodium carbonate	19
Chlorinated isocyanurate***	2
Water	10

8.7% Phosphorous(B)

<u>Compounds:</u>	<u>% by Weight</u>
BASF Surfactant*	3
Britesil H24 hydrous sodium silicate**	17
Sodium sulfate	14.5
Sodium carbonate	20
Chlorinated isocyanurate***	1.5
Sodium tripolyphosphate hexahydrate	44

Nonphosphate

<u>Compounds:</u>	<u>% by Weight</u>
BASF Surfactant*	4.0
Sokalan PA30CL	2****
Britesil H24 hydrous sodium silicate**	20
Chlorinated trisodium phosphate	12.5
Sodium sulfate	30
Sodium carbonate	1.5
Sodium citrate dihydrate	30

*Pluronic, Plurafac, and Industrol surfactant

**Other ratios of SiO₂ can be used. Liquid silicates can also be used in place of powders.

***Such as ACL-59.

****Active

Mixing Procedures:

To achieve maximum chlorine stability of the formulated detergent, the following process is suggested for the mixing of raw materials:

1. Spray a mixture of the surfactant and water (or surfactant, water, and liquid silicate) onto the phosphate builders, soda ash, or mixture thereof. Stir continuously while spraying. This process results in hydration of the bulders with simultaneous adsorption of the surfactant.
2. Add the chlorine-containing compound and any fillers to the mixture and continue mixing until the entire mixture is homogeneous. A dry, free-flowing granular product should be obtained with this method.

SOURCE: BASF Corp.: Suggested Formulations

Light Duty Liquid Detergents

Liquid detergents based on Pilot Calsoft, Calsuds and Calfoam surfactants produce safe, effective suds with excellent grease-cutting properties for hand dishwashing. Detergents containing Calamide C are especially mild to sensitive skin.

Pilot Formula #LDL-010-01

	<u>% by Weight</u>
Water	61.00
Calsoft L-60	19.80
Calfax DB-45	9.90
Calfoam EA-603	5.00
Calamide C	3.00
Citric Acid	0.10
Perfume	0.10
Dye	0.10
Ammonium Chloride	1.00

Pilot Formula #LDL-013-01

	<u>% by Weight</u>
Calsuds A	70.00
Calfoam ES-303	10.00
Water*	20.00
Citric Acid	Q.S. pH 7
Perfume and Color	Q.S.

Pilot Formula #LDL-005-01

	<u>% by Weight</u>
Calsoft L-40	40.00
Calfoam EA-603	10.00
Calamide C	6.00
Pilot SXS-40	12.50
Water*	26.50
Citric Acid	Q.S. pH 7
Perfume and Color	Q.S.

Pilot Formula #LDL-015-01

	<u>% by Weight</u>
Calsuds CD-6	25.00
Calfoam EA-603	10.00
Pilot SXS-40	8.80
Calsoft LAS-99	6.00
Water*	50.20
Citric Acid	Q.S. pH 7
Perfume and Color	Q.S.

*May be opacified by replacing 1% of water with 1% latex opacifier. Opacifier should be diluted with water before addition.

SOURCE: Pilot Chemical Co.: Household Cleaner Formulations

Light Duty Liquid, Premium Hand Dishwash

	<u>% by Weight</u>
Water, D.I.	30.2
Witcolate SE-5	21.7
Witconate 1260 Slurry	36.7
Witcamide 128T	5.0
Petro LBA Liquid	1.9
Sodium Sulfate	2.6
Ethanol	1.8
Formalin	0.1
Perfume, Dye	q.s.

Blending Procedure:

Blend ingredients in the order listed. Adjust pH = 6.5-7.0 using Citric Acid.

Typical Properties:

Viscosity, cps: 230

Appearance: Clear Liquid

Formula 113

Light Duty Liquid Economy Hand Dishwash

	<u>% by Weight</u>
Water, D.I.	73.6
Witcolate SE-5	8.3
Witconate 1260 Slurry	13.5
Witcamide 128T	1.9
Petro LBA Liquid	1.0
Sodium Sulfate	0.6
Sodium Chloride	1.0
Formalin	0.1
Perfume, Dye	q.s.

Blending Procedure:

Blend ingredients in the order listed. Adjust pH = 6.5-7.0 using Citric Acid.

Typical Properties:

Viscosity, cps: 180

Appearance: Clear Liquid

Formula 115

SOURCE: Witco Corp.: Suggested Formulations

Liquid Hand Dish Detergent
Formula DW-0016

	<u>Wt.%</u>	<u>Wt.%</u>	<u>Wt.%</u>
	To 100	To 100	To 100
Water			
Caustic Soda (50%)	2.5	3.3	4.1
Dodecylbenzene sulfonic acid	10	13	16
Rhodapex NA-61	4.5	4.5	5
Alkamide DC 212/S	1	2	3
Cheelox BF-13	0.5	0.5	0.5
Citric Acid (50%), to pH 8	Q.S.	Q.S.	Q.S.
Sodium chloride	1	1	1
Fragrance	-	-	-
Dye	-	-	-
Opacifier (Morton)	-	-	-

Procedure

Add the ingredients in the order listed, with mixing. Mix until uniform after each addition. Citric acid and caustic soda are used for pH adjustment. Sodium chloride builds viscosity. Dissolve it in water before addition.

Dissolve the dye in water before addition. If opacifier is used, it should be diluted with water before addition. All pH adjustments must be completed before the opacifier is added.

Physical Properties

Appearance: Liquid, colored and opacified to preference
 pH, as is: 8
 pH, 1%: 7.2
 Viscosity: 200-400 cps
 Specific Gravity: 1.02+-0.05

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formula

Mechanical Dishwashing Detergent

Chlorinated
Formula DW-0009

	<u>Wt. %</u>
Sodium Carbonate (Lt. Density)	41.0
Antarox BL-330	2.0
Sodium Tripolyphosphate, Powder	34.0
Sodium Metasilicate Pentahydrate	20.0
Clearon CDB (FMC)	3.0

Procedure

Add the sodium carbonate to the mixer. Spray on the Antarox BL 330. Add the remaining ingredients in the order listed. Mix until uniform.

Physical Properties

Appearance: White, free-flowing powder
pH (1%): 11.2
Specific Gravity: 0.70

Mechanical Dishwashing Detergent Liquid

Formula DW-0010

	<u>Wt. %</u>
Igepal CO-730	0.5
Gantrez AN-149	1.0
Potassium Hydroxide (45% Active)	3.0
Sodium Silicate (46% Active)	17.0
Antarox BL-330	3.0
Tetrapotassium Pyrophosphate (60% Active)	63.3
Water	12.2

Procedure

1. Add Gantrez AN-149 to Igepal CO-730/water mixture and stir at room temperature until dissolved. Heat to 45-50C if not totally in solution.
2. Maintain heat at 45C and add rest of ingredients individually.

Physical Properties

pH (as is): 13.2
pH (1%): 10.4
Viscosity: 1060 cps
Specific Gravity: 1.14

SOURCE: Rhone-Poulenc Specialties & Surfactants: Formulas

Non-DDBSA Dishwashing Liquid
Formula DW-0008

	<u>Wt. %</u>
Rhodacal A-246/L	60.0
Rhodapex MA-460	10.0
Alkamide DC-212/S	5.0
Sodium Xylene Sulfonate (40%)	4.0
Opacifier (Morton)	1.0
Water	20.0
Citric Acid to pH 6.5-7.5	Q.S.
Perfume and Color	Q.S.

Procedure

1. Charge water and sodium xylene sulfonate to vessel equipped with agitation.
2. Add Rhodacal A-246/L and Rhodapex MA-360 to vessel and mix until uniform.
3. Add Alkamide DC-212/S and mix as above.
4. Adjust pH 6.5-7.5 with citric acid.
5. Add opacifier (optional), perfume and colorant, as desired.

Physical Properties:

Appearance: Clear gold liquid, dye and opacify to preference.
 pH, as is: 6.5-7.5
 Specific Gravity: 1.02-1.04
 Viscosity: 200-300 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formula

Starting Formulations for Commercial Machine Dishwashing**Detergents****Nonchlorine/Noncaustic**

	<u>% by Weight</u>
BASF Surfactant*	3
Sodium tripolyphosphate	34
Sodium carbonate	22
Sodium sulfate	11
Sodium metasilicate pentahydrate	25
Water	5

Noncaustic

	<u>% by Weight</u>
BASF Surfactant*	3
Sodium tripolyphosphate	31.5
Sodium carbonate	20
Sodium metasilicate pentahydrate	31.5
Chlorinated isocyanurate**	1.5
Water	12.5

Chlorine/Caustic

	<u>% by Weight</u>
BASF Surfactant*	3
Sodium tripolyphosphate	34
Sodium carbonate	18
Sodium metasilicate pentahydrate	22.5
Chlorinated isocyanurate**	2.5
Sodium hydroxide (90%)	15
Water	5

*Pluronic, Plurafac, Industrol surfactant

**Such as ACL-59

Mixing Procedures:

1. Thoroughly mix the phosphate and carbonate.
2. In a separate container, mix the surfactant and water. Next, spray this liquid onto the phosphate/carbonate mixture. Mix continuously while spraying, and continue mixing until the liquid is completely adsorbed and the mixture is homogeneous.
3. Add the metasilicate, sulfate, and/or caustic and mix.
4. Finally, add the chlorinated cyanurate and mix thoroughly.

Note:

The mixing sequence given above is necessary for maintaining maximum chlorine stability.

SOURCE: BASF Corp.: Suggested Formulations

5. General Purpose Cleaners

All Purpose Cleaner

	<u>Weight, %</u>
Mackam 2CSF	10.0
Tetrapotassium Pyrophosphate	5.0
Trisodium Polyphosphate	5.0
KOH (45%)	4.0
Low Rosin Tall Oil Fatty Acid	10.0
Deionized Water	66.0

Procedure:

1. Dissolve Tetrapotassium Pyrophosphate and Trisodium Polyphosphate at 70C.
2. Add KOH.
3. Disperse Tall Oil Fatty Acid.
4. Cool to 50C and slowly add Mackam 2CSF.

Phosphate Free All Purpose Cleaner

	<u>Weight, %</u>
Sodium Metasilicate Pentahydrate	22.0
Mackamine C-10	9.0
Caustic Soda (50%)	2.0
Mackam 2CYSF	4.0
Tetrasodium EDTA (40%)	1.0
Deionized Water	62.0

Procedure:

1. Add Sodium Metasilicate and Tetrasodium EDTA to water and heat to 60C.
2. Add Mackamine C-10 and Caustic Soda (50%).
3. Add Mackam 2CYSF and blend until clear.

Bathroom Tile Cleaner

	<u>Weight, %</u>
Sodium Hypochlorite (35%)	4.7
Mackamine LO	5.0
Tetrasodium EDTA	1.0
Deionized Water	89.3

Procedure:

Add components to water and blend until clear.

SOURCE: McIntyre Group Ltd.: Suggested Formulations

All Purpose Cleaner

	<u>% by Weight</u>
Water	61.2
Sodium Carbonate	5.0
Tetrasodium EDTA, 40%	6.0
Witcolate 7031	15.0
Sodium Chloride	10.8
Witconate SXS Liquid	2.0
Citric Acid, 50%	q.s. to pH=11.0-11.5

Blending Procedure:

Blend ingredients in the order listed.

Typical Properties:

Viscosity, cps: Water thin

Solids: 25.6%

pH, as is: 11.2

SOURCE: Witco Corp.: Formula 518

All-Purpose Cleaner

	<u>% by Weight</u>
Eastman EB solvent	3.2
Na4EDTA*	2.7
Nonionic surfactant**	2.3
Isopropyl alcohol	1.5
Water	90.3

*Tetrasodium ethylenediaminetetracetate (39%)

**Such as Neodol 23-7 alcohol ethoxylate (Shell) or Sulfonic N-95 ethoxylated nonylphenol (Texaco).

Hard-Surface Cleaner

	<u>% by Weight</u>
Eastman DB solvent	7.0
Anionic surfactant***	1.0
Na4EDTA****	1.25
Ammonium Hydroxide (28%)	2.0
Water	88.75

***Such as Rhodapex CO-433 (Rhone-Poulenc)

****Tetrasodium ethylenediaminetetraacetate (39%)

SOURCE: Eastman Chemical Co.: Eastman EB and DB Solvents for Cleaners: Suggested Formulations

All-Purpose Cleaner-A

	%
Marlipal 24/90	7.5
Methoxypropanol	6.0
Sodium carbonate	3.0
Nitrilotriacetate, 40%	0.4
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100
Active matter: 7.5%	
Viscosity: Liquid	

All-Purpose Cleaner-B

	%
Marlipal 1012/6	1.0
Marlinat 242/28	10.0
Sodium carbonate	3.0
Sodium citrate dihydrate	1.5
Sodium tartrate	1.5
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100
Active matter: 3.8%	
Viscosity: Low	

All-Purpose Cleaner, with Microbicidal Properties, Liquid-B

	%
Marlipal 013/99	8.0
Marlazin KC 21/50	5.0
Nitrilotriacetate, 40%	0.5
Sodium carbonate	3.0
Balance water, fragrance, dyestuff	to 100
Active matter: 9.7%	

SOURCE: Huls America, Inc.: Basic Formulations of Detergents
and Cleaning Agents for Household Purposes

All-Purpose Cleaner, Liquid-A

	%
Marlon PS 65	3.0
Marlipal 013/89	1.0
Coconut fatty acid	0.2
Citric terpene	2.0
Methoxypropanol	3.0
Sodium carbonate	3.0
Sodium citrate dihydrate	3.0
Ethylenediamine tetraacetate, 40%	0.2
Balance water, fragrance, dyestuff, preservative	to 100

Active matter: 3.1%

All-Purpose Cleaner, Liquid-B

	%
Marlipal 013/89	5.0
Citric terpene	0.2
Methoxypropanol	5.0
Sodium carbonate	3.0
Citric acid	1.0
Nitrilotriacetate, 40%	0.2
KNA cumene sulphonate 40	1.0
Balance water, fragrance, dyestuff, preservative	to 100

Active matter: 4.5%

All-Purpose Cleaner, with Microbicidal Properties, Liquid-A

	%
Marlipal 013/99	7.5
Nitrilotriacetate, 40%	2.0
Lonzabac 12.30	3.0
Sodium carbonate	3.0
KNA cumene sulphate 40	2.0
Balance water, fragrance, dyestuff	to 100

Active matter: 6.8%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents
and Cleaning Agents for Household Purposes

All-Purpose Cleaner, Pasty-A

	%
Marlon AS3	10.0
Caustic soda, 50% (approx.)	2.6
Marlinat 242/28	15.5
Marlipal 013/30	3.0
Tylose CBR 10000	4.0
Titanium dioxide	0.1
Sodium chloride (approx.)	2.0
Balance water, fragrance, preservative	to 100
Active matter: 18.0%	

All-Purpose Cleaner, Pasty-B

	%
Marlon PF 40	45.0
Marlipal 013/30	2.0
Marlamid DF 1218	2.0
Tylose CBR 10000	4.0
Titanium dioxide	0.1
Sodium chloride (approx.)	8.0
Balance water, fragrance, preservative	to 100
Active matter: 22.0%	

All-Purpose Cleaner, With Soap, High Viscosity-A

	%
Marlon PF 40	5.0
Oleic acid	10.0
Caustic potash, 50%* (approx.)	3.9
Potassium carbonate*	1.0
Ethylenediamine tetraacetate, 40%	0.2
Balance water, fragrance, dyestuff, preservative	to 100
Active matter: 12.8%	

All-Purpose Cleaner, With Soap, High Viscosity-B

	%
Marlipal 24/79	2.0
Marlipal 242/28	5.0
Oleic Acid	8.0
Caustic potash, 50%* (approx.)	3.1
Sodium citrate dihydrate	1.5
Ethylenediamine tetraacetate, 40%	0.2
Ethanol*	1.5
Balance water, fragrance, dyestuff, preservative	to 100
Active matter: 11.8%	

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Products

D-Limonene Emulsifiable Concentrate

Formula HS-0094

<u>Component</u>	<u>Wt. %</u>
D-Limonene	80.0
Rhodacal IPAM	15.0
Igepal CO-720	4.0
Triethanolamine	1.0

Procedure

Blend ingredients in order listed and mix until uniform.

Physical Properties

Appearance: Clear, yellow liquid

Specific Gravity: 0.9

Viscosity: <10 cps

pH, as is: 10.0

Note: Product forms milky white emulsions when diluted with water.

D-Limonene All-Purpose Cleaner

Formula HS-0033

<u>Component:</u>	<u>Wt. %</u>
Water	73.5
Sodium Metasilicate-Pentahydrate	2.0
Miranol FBS	10.0
Rhodasurf 91-6	3.5
Cheelox BF-13	5.0
Alkamide DC-212/M	3.0
D-Limonene	2.0

Procedure

Blend ingredients in order listed and mix until uniform.

Physical Properties

Appearance: Slightly hazy, yellow liquid

pH, as is: 1.25

Specific Gravity: 1.02

Viscosity: <10 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

General Cleaners

Cleaner-Household

<u>Ingredients:</u>	<u>% by Weight</u>
Tetrapotassium Pyrophosphate	8.0
Dodecylbenzene Sulfonate Triethanolamine Salt	4.0
Aerosol A-103 Surfactant	4.0
Lauric Diethanolamide	2.0
Sodium Xylene Sulfonate	76.0

Mix all of the above together at one time.

Alkaline Cleaner

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OS Surfactant	5.0
Sodium Metasilicate	50.0
Caustic Soda	5.0
Tetrasodium Pyrophosphate	7.0
Trisodium Phosphate	33.0

Liquid Hand Cleaner

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol A-102 Surfactant	60.0
Mineral Oil	10.0
Coconut Oil	5.0
n-Propanol or Isopropanol	5.0
Triethanolamine	0.5
Germicide	0.1
Water	19.4

Germicidal Cleaner

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol 22, Aerosol OS, Aerosol A-102 Surfactant or mixture	10.0
Tetrapotassium Pyrophosphate	7.0
Dowicide 32	5.0
Isopropanol	3.0
Water	75.0

SOURCE: Cytec Industries Inc.: Suggested Formulations

High-Performance General Purpose Cleaner Concentrate
Formula HS-0038

	<u>Wt. %</u>
Water	65.0
STPP (Anhydrous Granular)	6.0
Rhodapon UB	13.0
Rhodapon BOS	5.0
Alcodet HSC-1000	5.0
Butoxyethanol	4.0
Miranol FBS	2.0

Procedure

Blend ingredients in order listed and mix until uniform.

Physical Properties

Appearance: Clear, light yellow liquid

pH, as is: 9.4

Specific Gravity: 1.06

Viscosity: <10 cps

Heavy-Duty Cleaner Powder
Formula HS-0039

	<u>Wt. %</u>
Trisodium Phosphate or Sodium Carbonate	40
Sodium Silicate	10
Rhodacal DS-10	20
Sodium Sulfate	30
Fragrance	Q.S.

Procedure

Add ingredients in order listed to powder blender. Mix until uniform.

Physical Properties

Appearance: White, free-flowing powder

pH, 1% Solution: 10.8

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

**Neutral All-Purpose Cleaner, with Pearlescence Effect,
High Viscosity-A**

	%
Marlon PS 65	7.5
Marlinat 242/28	4.5
Marlamid DF 1218	1.0
Marlamid PG 20	2.0
Cellobond HEC 100000A	0.7
Balance water, fragrance, dyestuff, preservative	to 100
Active matter: 7.2%	

**Neutral All-Purpose Cleaner, with Pearlescence Effect,
High Viscosity-B**

	%
Marlinat DFK 30	5.0
Marlinat 242/28	2.0
Marlamid DF 1218	1.0
Marlipal 24/90	1.0
Marlamid PG 20	1.0
Cellobond HEC 100000A	0.9
Balance water, fragrance, dyestuff, preservative	to 100
Active matter: 5.0%	

All-Purpose Cleaner, with Acetic Acid-A

	%
Marlipal 1012/6	1.5
Marlinat 242/28	15.0
Sodium citrate dihydrate	1.0
Acetic acid*	2.0
Sodium chloride (approx.)	6.5
Balance water, fragrance, dyestuff	to 100
Active matter: 5.7%	
Viscosity: low	

All-Purpose Cleaner, with Acetic Acid-B

	%
Marlon PS 65	5.0
Acetic acid*	6.0
Balance water, fragrance, dyestuff	to 100
Active matter: 3.3%	
Viscosity: liquid	
*further products of Huls AG	

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and
Cleaning Agents for Household Purposes

Non-Phosphate All Purpose Cleaner

<u>Components:</u>	<u>% by Weight</u>
Water	77.15
45% KOH	0.75
Burcosperse AP Liquid	3.00
Sodium Xylene Sulfonates 40%	3.40
Sodium Citrate	1.00
Dodecylbenzene Sulfonic Acid	1.75
Burco TME	6.00
Butyl Propasol	6.00
Varsol or Mineral Spirits	0.95

Procedure:

Add components in the order listed. Blend until uniform between each addition.

Oil Splitting General Purpose Cleaner

<u>Components:</u>	<u>% by Weight</u>
Water	82.5
Sodium Metasilicate Pentahydrate	5.0
Burco ADS-40	2.5
Burco TME	5.0
Burco LAA-38	2.5
Burco EHS	2.5

Procedure:

Add components in the order listed. Blend until fully dissolved between each addition.

This is a use as is formulation for heavy duty cleaning. For lighter duty applications, dilution with water may be possible. This formulation will suspend oil to assist with removal. The suspended oil will then float for easy removal.

SOURCE: Burlington Chemical Co., Inc.: Suggested Formulations

Scouring Cleaner, Medium Viscosity-A

	%
Marlon PS65	4.3
Marlipal 013/30	2.7
Sodium sulphate	1.5
Calcium carbonate, e.g. Durcal 40	50.0
Balance water, dyestuff, fragrance, preservative	to 100

Active matter: 5.5%

Scouring Cleaner, Medium Viscosity-B

	%
Marlon PS 65	3.5
Marlipal 013/30	3.0
Marlinat 242/28	2.0
Sodium carbonate	1.5
Calcium carbonate, e.g. Durcal 40	50.0
Balance water, dyestuff, fragrance, preservative	to 100

Active matter: 5.8%

Scouring Cleaner, Powder-A

	%
Marlon ARL	5.0
Sodium carbonate, dehydrated	5.0
Sodium dichloroisocyanurate	1.0
Calcium carbonate powder (abrasive)	to 100

Active matter: 4.0%

Scouring Cleaner, Powder-B

	%
Marlon ARL	5.0
Sodium carbonate, dehydrated	5.0
Sodium tripolyphosphate	2.0
Calcium carbonate powder (abrasive)	to 100

Active matter: 4.0%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

6. Glass Cleaners/Polishes

Antifog Compositions for Application to Cloth

Special wiping cloths impregnated with Aerosol OT Surfactant are used to clean and to prevent fogging of eye glasses, binoculars, goggles, eyepieces in gas masks, and automobile, train, plane, and boat windshields. Such wiping cloths are prepared by impregnating cotton flannel with Aerosol OT Surfactant solutions followed by a run through squeeze rolls to remove the excess liquor.

Three successful formulations containing Aerosol OT Surfactant at 25% solids and one formulation at 50% solids are as follows:

<u>Ingredients-1:</u>	<u>25% Solution</u>
Aerosol OT-75% Surfactant (lb.)	113
Varsol No. 2 Petroleum Solvent (gal.)	15
Isopropyl Alcohol (gal.)	3
Water (gal.)	19

<u>Ingredients-2:</u>	<u>25% Solution</u>
Aerosol OT-75% Surfactant (lb.)	113
Varsol No. 2 Petroleum Solvent (gal.)	6
Isopropyl Alcohol (gal.)	6
Water (gal.)	25

<u>Ingredients-3:</u>	<u>25% Solution</u>
Aerosol OT-75% Surfactant (lb.)	113
Varsol No. 2 Petroleum Solvent (gal.)	-
Isopropyl Alcohol (gal.)	8
Water (gal.)	29

<u>Ingredients-4:</u>	<u>50% Solution</u>
Aerosol OT-75% Surfactant (lb.)	66
Varsol No. 2 Petroleum Solvent (gal.)	2
Isopropyl Alcohol (gal.)	-
Water (gal.)	3

The solvents and water are mixed at 80F to 100F. The Aerosol OT-75% Surfactant is added slowly with continued mixing. After the Aerosol OT has dissolved, all solutions will remain clear and liquid at temperatures as low as 50F. No scumming of the surface will occur because of evaporation during a normal run of cloth through the bath. The solutions that are allowed to stand should be covered to prevent loss of solvent.

The optimum amount of Aerosol OT Surfactant to be left on the cloth is 40-50%, based on the weight of the cloth. However, a range of 25-50% will give satisfactory results.

SOURCE: Cytec Industries Inc.: Suggested Formulations

Antifog Compositions for Direct Application to Glass

Aerosol OT Surfactant is used in special formulations that are applied directly to glass surfaces to prevent fogging under adverse weather conditions. Some of these formulations give durable films that stand up under severe tests. An example of an excellent "Antifog" paste is as follows:

Aerosol OT-75% Surfactant	10.7 lb.
Gum Tragacanth	2.0 lb.
Petrolatum	2.0 lb.
Water	85.3 lb.

Heat the water to 180F and add the Aerosol OT-75% slowly with mixing. Sift in powdered gum tragacanth. Continue mixing until all gum is dispersed, cool to 105F, and add petrolatum.

Application of Antifog Paste:

Dampen the corner of a piece of cloth with paste and rub over entire glass surface. Before film becomes dry, polish well with clean portion of the cloth.

A spray bomb of Antifog may be prepared as follows:

Aerosol OT-75% Surfactant	10 parts
Butyl Cellosolve Solvent	10 parts
Propellant	80 parts

Aerosol OT Surfactant may also be cast into stick form. Softening agents such as glycerine or ethylene glycol are incorporated to simplify application to the glass surface. Such sticks, usually two to four inches long and one-half inch in diameter, are sold in kits for application to goggles, windshield wipes and bathroom mirrors.

SOURCE: Cytac Industries, Inc.: Suggested Formulations

Anti-Fogging, Anti-Static Glass Cleaner

	<u>% by Weight</u>
Water, D.I.	90.0
Isopropanol	9.0
Adogen 66	0.1
Varox 365	0.5
Emcol 4500	0.4

Blending Procedure:

Combine ingredients in the order shown and mix thoroughly. If product is hazy, additional Isopropanol can be used to clarify the solution. Gentle heating can be used to facilitate mixing of the Emcol 4500.

Use Instructions:

Apply finished product to a towellete (Kimwipe, etc.) and wipe onto the glass. Allow to dry.

Product Information:

Product:	Benefit:
Varox 365	Wetting agent, degreaser, and detergent
Adogen 66	Anti-static agent
Emcol 4500	Wetting agent, coupler, and detergent

This formulation presents a thin barrier between the water vapor (i.e., fog, steam, etc.) and the glass which will prevent fogging. The ability to lower the surface tension of the water prevents the clinging of individual water droplets to the glass; therefore light is not scattered as much as it is when passing through individual droplets.

Formula 708

Ammoniated Glass Cleaner

	<u>% by Weight</u>
Water	94.0
Witcolate 2310	3.0
Butyl Cellosolve	2.0
Aqua Ammonia, 26 Be'	2.0

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Formula 704

SOURCE: Witco Corp.: Suggested Formulations

Glass Cleaners
Ammonia
Formula GC-0017

	<u>Economical</u>	<u>Heavy-Duty</u>
	<u>Wt. %</u>	<u>Wt. %</u>
Water	94.60	88.70
Rhodacal DSB	0.15	0.30
Butoxyethanol	5.00	10.00
Ammonium Hydroxide (28%)	0.25	1.00
Dye	-	-

Procedure

Blend ingredients in order listed and mix until uniform.

Physical Properties

Appearance: Clear liquid, dye to preference		
pH (as is):	10.5	10.8
pH (1%):	9.0	9.7
Specific Gravity:	0.99	0.99
Viscosity:	<10 cps	<10 cps

Glass Cleaners
Vinegar
Formula GC-0018

	<u>Economical</u>	<u>Heavy-Duty</u>
	<u>Wt. %</u>	<u>Wt. %</u>
Water	94.85	89.70
Rhodacal DSB	0.15	0.30
Butoxyethanol	5.00	10.00
Acetic Acid	To pH=4	To pH=4
Dye	-	-

Procedure

Blend ingredients in order listed and mix until uniform.

Physical Properties

Appearance: Clear liquid, dye to preference		
pH (as is):	4.0	4.0
pH (1%):	3.5	3.5
Specific Gravity:	0.99	0.99
Viscosity:	<10 cps	<10 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Glassware and Bottle Cleaners
Bottle Cleaner (Alkaline-Powder)

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OT-B Surfactant	2.0
Sodium NTA Powder	20.0
Cyanamer A-100L Polyacrylamide	5.0
Sodium Metasilicate	8.0
Tetrasodium Pyrophosphate	65.0

Bottle Cleaner (Acid-Powder)

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OT-B Surfactant	2.0
NTA Acid	20.0
Sodium Dihydrogen Phosphate	58.0
Sodium Hydrogen Sulfate	20.0

Bottle Cleaner (Alkaline-Powder)

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OS Surfactant	5-10
Aerosol OT-B Surfactant	1- 2
Sodium NTA Powder	20.0
Sodium Metasilicate	8.0
Tetrasodium Pyrophosphate	60-66

Bottle Cleaner (Acid-Liquid)

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol GPG Surfactant	5.0
Phosphoric Acid (85%)	to pH 3.0 or less
NTA Acid	20.0
Water	75.0

Bottle Cleaner (Acid-Liquid)

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OS Surfactant	10.0
NTA Acid	20.0
Phosphoric Acid (85%)	to pH 3.0 or less
Water	70.0

Bottle Cleaner (Highly Alkaline)

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OS Surfactant	10.0
Aerosol 22 Surfactant	2.0
Sodium NTA	20.0
Sodium Hydroxide (10%)	68.0
SOURCE: Cytec Industries Inc.: Suggested Formulations	

Household Window Cleaner

	<u>% by Weight</u>
Water, D.I.	89.3
Isopropanol	10.0
Varox 365	0.7
Methylene Blue	q.s.

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 4

Solids: 0.2%

pH: 7.4

Formula 706

Premium Household Window Cleaner

	<u>% by Weight</u>
Water, D.I.	89.4
Isopropanol	10.0
Varox 1770	0.6
Methylene Blue	q.s.

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 4

Solids: 0.23%

pH: 6.2

Formula 707

SOURCE: Witco Corp.: Suggested Formulations

Low VOC Antistat/Cleaner for Glass

<u>Ingredient:</u>	<u>%W/W</u>
Versaflex 7000	1.00
Isopropanol	5.00
Ammonium Hydroxide (30%)	0.50
Neodol 25-3S (58%)	0.15
Water, Fragrance, and Preservative	q.s.

Procedure:

1. Dissolve Versaflex 7000 in water.
2. Add ammonium hydroxide and Neodol 25-3S, and mix.
3. Add isopropanol and mix.
4. Add fragrance and preservative.

SOURCE: National Starch and Chemical Co.: Reference: #8069:32

Anti-Fog Glass Cleaner

<u>Ingredients:</u>	<u>% by Weight</u>
Water	93.0
Monawet MO-70R	2.0
IPA	5.0

Procedure:

Blend in order listed and package.

SOURCE: Mona Industries, Inc.: Suggested Formulation

Glass Cleaner

	<u>% by Weight</u>
Eastman EB solvent	3.0
Isopropyl alcohol	5.0
Nonionic surfactant*	0.1
Water	91.9

*Such as Tergitol 15-S-7, C11-C15 secondary alcohol ethoxylate (Union Carbide) or Genapol 24-L-60 linear alcohol ethoxylate (Hoechst Celanese).

SOURCE: Eastman Chemical Co.: Eastman EB and DB Solvents for Cleaners: Suggested Formulation

Traditional Consumer Glass Cleaner
Ammoniated Anionic Non-Streaking Glass Cleaner

Ingredient:	Wt. %
Deionized Water	94.05
2-Butoxyethanol	5.70
Avanel S-70	0.25
C.I. Direct Blue #86	Q.S.
Monoethanolamine	to pH 10.5-11.5
pH (as is): 10.5-11.5	
Appearance: Clear, light-blue liquid	
Odor: Sweet, ethereal	

Procedure:

Charge under agitation most of the water, the 2-butoxyethanol, and the Avanel S-70 into the mixing vessel. In a separate vessel, under agitation, dissolve the dye in the balance of the water. Add the dye solution to the batch. Adjust pH to 10.5-11.5 with Monoethanolamine.

Notes:

This formulation incorporates a novel anionic surfactant into a traditional ammoniated glass cleaner.

On prolonged storage, glycol ethers have been shown to form peroxy compounds which can adversely affect the dyes normally used in glass cleaners. Morpholine, Ammonia, or other volatile amines may be used in place of the Monoethanolamine.

Formula CG-101

Consumer Acid Glass Cleaner
Acid Anionic Non-Streaking Glass Cleaner

Ingredient:	Wt. %
Deionized Water	89.70
2-Butoxyethanol	10.00
Avanel S-70	0.30
Color	Q.S.
Acetic Acid	to pH 3.5-4.0
pH (as is): 3.5-4.0	
Appearance: Clear liquid	
Odor: Sweet, ethereal	

Procedure:

Charge under agitation most of the water, the 2-butoxyethanol, and the Avanel S-70 into the mixing vessel. In a separate vessel, under agitation, dissolve the dye in the balance of the water. Add the dye solution to the batch. Adjust pH to 3.5-4.0 with Acetic Acid.

Notes:

This formulation is particularly effective at removing oil, greases and other atmospheric contaminants from glass surfaces.

On prolonged storage, glycol ethers have been shown to form peroxy compounds which can adversely affect the dyes normally used in glass cleaners. Dyes should be thoroughly screened for shelf stability in the finished product prior to adoption into the finished formulation.

Formula CG-102

SOURCE: Mazer Chemicals: Suggested Formulations

7. Hard Surface Cleaners

Abrasive Cleaner-1**Ingredients:**

A	Hostapur SAS 60	4.50%
	Genapol UD-030	5.40%
B	Water (40-50C)	59.80%
C	Preservative	0.10%
	Perfume	0.20%
D	Calibrite SL	30.00%

Tests:

Viscosity (mPas): 1700 (Brookfield RVT)
pH: 10,0

Abrasive Cleaner-2**Ingredients:**

A	Hostapur SAS 60	4.50%
	Genapol UD-030	5.40%
B	Water (40-50C)	49.80%
C	Preservative	0.10%
	Perfume	0.20%
D	Calibrite SL	40.00%

Tests:

Viscosity (mPas): 2800 (Brookfield RVT)
pH: 10,0

Abrasive Cleaner-3**Ingredients:**

A	Hostapur SAS 60	4.50%
	Genapol UD-030	5.40%
B	Water (40-50C)	39.80%
C	Preservative	0.10%
	Perfume	0.20%
D	Calibrite SL	50.00%

Tests:

Viscosity (mPas): 6400 (Brookfield RVT)
pH: 10,00

Manufacturing(1,2,3):

- I One after another, the components of A are added to B.
- II At 30C the components of C are added to I.
- III At last, stir D to II.

Abrasive powders, based on silicium dioxide are not common any longer. Modern liquid products are based on calcium carbonate.

SOURCE: Hoechst Aktiengesellschaft: Detergents and Cleaning Agents: Guide Formulations

Concentrated Liquid Household Hard-Surface Cleaner
Pine Oil All-Purpose Dilutable Concentrate

<u>Ingredient:</u>	<u>Wt.%</u>
Deionized Water	79.30
Macol TD-12	5.00
Macol TD-3	2.50
Mazamide 80	0.50
Macol 48	4.00
Pine Oil	0.20
Tetrapotassium Pyrophosphate	3.00
Sodium Metasilicate Pentahydrate	2.00
Sodium Xylene Sulfonate (40%)	3.50

pH (as is): 12.5-13.5

Appearance: Clear, light-yellow liquid

Specific Gravity: 1.03

Procedure:

Charge the water to a mixing vessel and start agitation. Charge the Macol TD-12, Macol TD-3, and Macol 48 and mix until product is clear and free of "fish eyes." Charge the Pine Oil and mix 5 minutes. Charge the remaining ingredients and mix until clear.

Notes:

This is a concentrated household hard-surface cleaner designed to be used at a dilution of 1-3 ounces per gallon.
 Formula CH-103

All-Purpose Household Spray Cleaner
Ready to Use Alkaline Hard Surface Spray Cleaner

<u>Ingredient:</u>	<u>Wt.%</u>
Deionized Water	95.15
Macol TD-12	1.00
Sodium Citrate	0.25
Tetrapotassium Pyrophosphate	0.60
Macol 48	3.00

pH (as is): 9.5-10.5

Appearance: Clear, water-white liquid

Specific Gravity: 0.99

Procedure:

Charge the water to a mixing vessel and start agitation. Charge the Macol TD-12 and mix until dissolved and free of "fish eyes." Charge the remaining ingredients and mix until clear.

Notes:

This is an all-purpose household cleaner designed to be used "as is" from a spray bottle.
 Formula CH-104

SOURCE: Mazer Chemicals: Suggested Formulations

Consumer Tile Cleaner**A Hard Surface Hypochlorite Spray Cleaner**

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	81.00
Sodium Hydroxide (50%)	2.00
Sodium Hypochlorite (12.5%)	16.00
Avanel S-70	1.00

pH (as is): >12.5

Appearance: Clear, water-white to light-yellow liquid

Procedure:

Charge the ingredients with agitation in the order listed.

Notes:

This formula is suitable for pump spray application. It can be used on shower tiles and like surfaces.

Shelf stability of chlorine cleaners is dependent on the absence of trace metals. Care should be taken to insure good quality water and Sodium Hypochlorite.

Formula may be adjusted to use other commercially available concentrations of Sodium Hypochlorite. Absolute concentration of available chlorine is 2.0%.

Formula CC-101

Industrial Strength Chlorine Cleaner**A Hard Surface Industrial Strength Hypochlorite Spray Cleaner**

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	56.00
Sodium Hydroxide (50%)	3.00
Sodium Hypochlorite (12.5%)	40.00
Avanel S-70	1.00

pH (as is): >12.5

Appearance: Clear, water-white to light-yellow liquid

Odor: Chlorine

Procedure:

Charge the ingredients with agitation in the order listed.

Notes:

This formulation can be used in high-pressure spray washing cleaners, diluted for hard-surface cleaning or used as is for an enhanced consumer household bleach.

Shelf stability of chlorine cleaners is dependent on the absence of trace metals. Care should be taken to insure good quality water and Sodium Hypochlorite.

Formula may be adjusted to use other commercially available concentrations of Sodium Hypochlorite. Absolute concentration of available chlorine is 5.0%.

Formula CC-102

SOURCE: Mazer Chemicals: Suggested Formulations

D-Limonene Hard-Surface Cleaners

Formula HS-0093

Component	D-Limonene Concentrate	All-Purpose Spray Cleaner Type (1:9 Dilution)	Heavy-Duty Degreaser Type (1:3 Dilution)
	Wt. %	Wt. %	Wt. %
D-Limonene	20.0	2.0	5.0
Alcodet HSC-1000	30.0	3.0	7.5
Igepal CO-720	30.0	3.0	7.5
Miranol FBS	19.0	1.9	4.75
Triethanolamine	1.0	0.1	0.25
Water	---	90.0	75.0

Procedure

- A. **Concentrate** Blend ingredients in order listed and mix until uniform.
- B. **Spray Cleaner** Dilute concentrate 1:9 with water or charge "Vessel A" with D-Limonene, Alcodet HSC-1000, and then Igepal CO-720. Mix until uniform. Charge a separate "Vessel B" with water, triethanolamine and Miranol FBS. Mix until uniform. Finally, add the contents of "Vessel A" to "Vessel B" and mix until uniform.
- C. **Degreaser** Dilute concentrate 1:3 with water or blend ingredients in the same manner as specified in the spray cleaner procedure.

Physical Properties

	<u>Concentrate</u>	<u>Spray Cleaner</u>	<u>Degreaser</u>
Appearance	Clear, gold liquid	Clear, light yellow liquid	Clear, yellow liquid
Specific Gravity	1.02	1.00	1.00
Viscosity	110 cps	<10 cps	<10 cps
pH, as is	10.0	9.5	9.5

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

d'Limonene Spray Cleaner

	<u>% by Weight</u>
Phase A:	
Water, D.I.	68.0
Tetrapotassium Pyrophosphate	6.0
Sodium Metasilicate, Anhydrous	2.0
Petro LBA Liquid	10.0
Witconate AOS	3.0
Phase B:	
DeSonic 9N	5.0
Witcamide 128T	3.0
d'Limonene*	3.0

*Sunkist Growers, Inc. or Union Camp

Blending Procedure:

Blend Phase A and Phase B separately. With mixer at high speed, add Phase B to Phase A.

Use Dilution: use as is.

Formula 802

d'Limonene Cleaner Concentrate

	<u>% by Weight</u>
Phase I:	
Isopropanol	10.0
Oleic Acid	8.8
Varonic K205	5.0
d'Limonene	12.0
Phase II:	
Water, D.I.	62.2
Potassium Hydroxide, 87%	2.0

Blending Procedure:

Combine Phase I ingredients and mix thoroughly. Combine Phase II ingredients and mix thoroughly. While mixing, add Phase I to Phase II.

Typical Properties:

Viscosity, cps: 75
Solids: 13.8%
pH: 10.2

Formula 808

SOURCE: Witco Corp.: Suggested Formulations

General Purpose Hard Surface Cleaner

This general purpose cleaner is a versatile product. The combination of Sandoxylate SX-408 and Sandoxylate SX-424 provide excellent surface activity and soil removal allowing it to be used in many applications.

<u>Ingredients:</u>	<u>% by Wt</u>
Water	79.9
Sodium Silicate	1.0
Sodium Hydroxide (20% Solution)	0.5
Butyl Cellosolve	0.5
Sandoxylate SX-408	5.0
Sandoxylate SX-424	11.5
Sodium Xylene Sulfonate	1.5
Drimarine Turquoise XB	0.1

Procedure:

Charge vessel with water. Add sodium silicate, sodium hydroxide (20%), Butyl Cellosolve, Sandoxylate SX-408, Sandoxylate SX-424, Sodium Xylene Sulfonate and Drimarine Turquoise XB.

Suggested Use: 4 to 6 ounces per gallon of water.

SOURCE: Sandoz Chemicals Corp.: Formulation HHG-11

Alkaline Hard Surface Cleaner

	<u>% by Weight</u>
Water, D.I.	34.0
Sodium Metasilicate	8.0
Varamide A-83	12.0
Witconate 30DS	40.0
Witconate SXS Liquid	6.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 205
Solids: 34.4%
pH: 12.5

SOURCE: Witco Corp.: Formula 516

General Purpose Hard-Surface Cleaners
Formula HS-0034

<u>Component</u>	<u>Solvent-Free</u> <u>Non-Phosphate</u>	<u>Solvent-Free</u> <u>Phosphate</u>	<u>Heavy-Duty</u> <u>Solvent</u>
	<u>Type</u> <u>Wt. %</u>	<u>Type</u> <u>Wt. %</u>	<u>Type</u> <u>Wt. %</u>
Water	83.5	85.5	83.0
Sodium Metasilicate Pentahydrate	2.0	2.0	1.0
Rhodasurf 91-6	7.5	7.5	6.0
Cheelox BF-13	3.0	3.0	2.0
Miranol FBS	4.0	-	2.0
Rhodafac RA-600	-	2.0	-
Butoxyethanol	-	-	6.0

Procedure

Blend ingredients in order listed and mix until uniform.

Physical Properties

Appearance	Clear, lt. yellow	Clear, water-white	Clear, water-white
Specific Gravity	1.035	1.012	0.994
Viscosity	<10 cps	<10 cps	<10 cps
pH, as is	12.3	11.85	12.20

Unbuilt, High-Sudsing, Hard-Surface Cleaner
Formula HS-0036

<u>Component</u>	<u>Wt. %</u>
Water	79.7
Calsoft F-90	5.3
Miranol FBS	3.0
Sodium Silicate	5.5
Igepal CO-710	1.0
Alkamide DC-212/S	2.0
M-Pyrol, N-methyl-2-pyrrolidone (ISP)	3.5

Procedure

Blend ingredients in order listed and mix until uniform.

Typical Properties

Appearance: Clear, yellow liquid
Viscosity: <10 cps
pH, as is: 9.85
Specific Gravity: 1.07

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Hard-Surface Cleaner

<u>Ingredient:</u>	<u>Percent by Weight</u>
Liquid Citric Acid-50% (Haarman & Reimer Corp.)	4.0
Sodium hydroxide solution 50%	2.5
Nonionic surfactant (Neodol 25-9)	8.0
Methyl Carbitol solvent	7.0
Sodium xylene sulfonate	5.0
Sodium carbonate	3.0
Pine oil	0.3
Water	70.2

Mix the Liquid Citric Acid-50% solution with an equal volume of water and neutralize by adding sodium hydroxide. The neutralization reaction should be done slowly and cautiously under agitation, as the reaction is highly exothermic. Blend the neutralized solution with the nonionic surfactant, Methyl Carbitol, sodium xylene sulfonate and sodium carbonate. Add pine oil last.

Non-Abrasive Cleanser

<u>Ingredient:</u>	<u>Percent by Weight</u>
Liquid Citric Acid-50% (Haarman & Reimer Corp.)	6.0
Sodium hydroxide solution 50%	3.7
Xanthan gum	25.0
Vegetable gum (Veegum HS)	2.5
Amphoteric surfactant	3.0
Nonionic surfactant	1.5
Calcium carbonate (100 mesh)	45.0
Water	13.3

Prepare a 1% solution of xanthan gum with the inclusion of a preservative. Slowly add the vegetable gum to water and stir until thoroughly hydrated. Add the calcium carbonate, followed by the amphoteric surfactant, the nonionic surfactant and the xanthan gum solution.

SOURCE: Haarman & Reimer Corp.: Suggested Formulations

Hard-Surface Cleaner

	<u>% by Wt.</u>
Eastman DB solvent	7.0
Anionic surfactant*	1.0
Na4EDTA**	1.25
Ammonium hydroxide (28%)	2.0
Water	88.75

*Such as Rhodapex CO-433 (Rhône-Poulenc)

**Tetrasodium ethylenediaminetetracetate (39%)

SOURCE: Eastman Chemical Co.: Suggested Formulation

Hard-Surface Cleaner
All-Surface Bathroom Acid Type
Formula BC-0005

	<u>Wt. %</u>
M-Pyrol, N-Methyl-2-Pyrrolidone (ISP)	4.0
Igepal CO-630	1.0
Hydroxyethylcellulose	0.2
Phosphoric Acid	9.5
Water	85.3
Perfume and colorants may be added.	

Procedure

1. Disperse hydroxyethylcellulose in water.
2. In a separate vessel, mix M-pyrol, Igepal CO-630 together. Add hydroxyethylcellulose/water mixture.
3. Add acid and mix thoroughly.

Physical Properties

pH (as is): 2.0
 pH (1%): 2.4
 Viscosity: 30 cps
 Specific Gravity: 1.02

Hard-Surface Cleaner
All-Surface Bathroom Type
Formula BC-0006

	<u>Wt. %</u>
Water	70.5
Igepal CO-630	2.5
Cheelox NTA-Na3	20.0
Sodium Xylene Sulfonate	5.5
Sodium Hydroxide	1.5
Perfume and colorants added, as desired, replacing water.	

Procedure

1. Dissolve Igepal CO-630 in water. Add Cheelox NTA-Na3.
2. Add sodium xylene sulfonate and sodium hydroxide, mixing well after each addition.

Physical Properties

pH, as is: 12.9
 pH (1%): 11.4
 Viscosity: 10 cps
 Specific Gravity: 1.05

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Hard Surface Cleaners

Calsuds, Calsoft and Calamide concentrates can be formulated to create powerful, non-corrosive, non-filming cleaners for floors, woodwork, walls, windows, counter tops, tubs, tile and similar hard surfaces. Use levels: 1-4 oz./gal of water.

Floor Cleaner Products Pilot Formula #HSC-003-01

	<u>% by Weight</u>
Water	81.00
Na4EDTA	10.00
Calsoft F-90	4.00
Caloxylate N-9	2.00
Butyl Cellosolve	3.00

Pilot Formula #HDC-003-01

	<u>% by Weight</u>
Calsuds 81	5.00
TKPP	7.80
Pilot SXS-40	10.00
Water	77.20

Rug Cleaner Pilot Formula #CPT-003-01

	<u>% by Weight</u>
Calfoam SLS-30	40.09
Calamide C	4.04
Propylene Glycol	20.11
Water	35.76

Plastic, Vinyl and Leather Cleaner Pilot Formula #UPC-001-01

	<u>% by Weight</u>
Caloxylate N-9	10.10
Dowanol D (PnB)	5.02
Propylene Glycol	2.56
Butyl Cellosolve	1.13
Water	81.19

SOURCE: Pilot Chemical Co.: Household Cleaner Formulations

Hard Surface Cleaners

Calsuds, Calsoft and Calamide concentrates can be formulated to create powerful, non-corrosive, non-filming cleaners for floors, woodwork, walls, windows, counter tops, tubs, tile and similar hard surfaces. Use levels: 1-4 oz./gal. of water.

Tub and Tile Cleaners Pilot Formula #APC-004-01

	<u>% by Weight</u>
Water	65.00
Versene 100	1.00
Calsuds A	25.00
Isopropyl Alcohol	5.00
Propylene Glycol	3.00
Pine Oil	1.00

Pilot Formula #HDC-006-01

	<u>% by Weight</u>
D-limonene	30.00
Calimulse PRS	5.00
Caloxylate N-9	5.00
Water	26.50
Calsoft L-40	16.50
Pilot SXS-40	10.00
Calamide O	7.00

Counter Top/Wall Cleaners Pilot Formula #HDC-003-01 All Purpose Type

	<u>% by Weight</u>
Water	77.20
TKPP	7.80
Calsuds 81	5.00
Pilot SXS-40	10.00

Pilot Formula #HSC-008-01 Ammoniated Type

	<u>% by Weight</u>
Water	86.50
Ammonia (29%)	3.00
Na4EDTA	0.50
Butyl Cellosolve	5.00
Calsuds 81	5.00

SOURCE: Pilot Chemical Co.: Household Cleaner Formulations

Hard Surface Cleaner w/Amphoteric

	<u>% by Weight</u>
Water, D.I.	75.0
Sodium Carbonate	4.0
Rewoteric AM KSF-40	10.0
Dowanol DPM	5.0
Versene 100	2.0
Witconate SXS (40%)	4.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 4

Solids: 10.2%

pH: 10.8

Formula 507

Hard Surface Cleaner Concentrate w/d'Limonene

	<u>% by Weight</u>
Phase I:	
Isopropanol	10.0
Oleic Acid	8.8
Varonic K205	5.0
d'Limonene	12.0
Phase II:	
Water, D.I.	62.2
Potassium Hydroxide (87%)	2.0

Blending Procedure:

Combine Phase I ingredients and mix thoroughly. Combine Phase II ingredients and mix thoroughly. While mixing, add Phase I to Phase II.

Typical Properties:

Viscosity, cps: 75

Solids: 13.8%

pH: 10.2

Formula 508

SOURCE: Witco Corp.: Suggested Formulations

Hard-Surface Cleaner Concentrate
Alkaline All-Purpose Cleaner Concentrate

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	76.00
Sodium Hydroxide (50%)	2.00
Tetrapotassium Pyrophosphate	12.00
Sodium Metasilicate Pentahydrate	1.00
Avanel S-150	6.00
Sodium Cumene Sulfonate (40%)	3.00

pH (as is): 10.5-11.5

Appearance: Clear, light-yellow liquid

Specific Gravity: 1.13

Procedure:

Charge the water to an appropriate mixing vessel and start agitation. In the sequence listed above, charge the remaining ingredients and mix until the solution is clear.

Notes:

This is a hard-surface cleaner concentrate which is effective on many different soils and surfaces. For concrete surfaces, use "as is." For walls, floors, and other surfaces, dilute 10:1 with water.

Formula CH-101

Household Hard-Surface Cleaner
All-Purpose Alkaline Cleaner for Sponge or Spray Application

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	80.00
Sodium Laureth (3) Sulfate	2.50
Mazamide 80	0.50
Tetrapotassium Pyrophosphate	1.00
Sodium Metasilicate Pentahydrate	2.00
Macol 48	4.00
Deionized Water, Dye, etc.	Q.S.

pH (as is): 12.0-13.0

Appearance: Clear, water-white liquid (without dye)

Specific Gravity: 1.01

Procedure:

Charge the first portion of water to a mixing vessel and start agitation. If product is to be colored, dissolve dye in the reserved portion of the water in a separate vessel. Charge all remaining ingredients, including the dye solution, to the mixing vessel and mix until clear.

Notes:

This formulation is designed as a general purpose household cleaner. The product may be used with a sponge or may be used in a spray bottle.

Formula CH-102

SOURCE: Mazer Chemicals: Suggested Formulations

High-Performance, Hard-Surface Cleaners

Formula HS-0035

<u>Component</u>	Solvent-Free Non-Phosphate	Solvent-Free Phosphate	Heavy-Duty Solvent
	<u>Type</u> <u>Wt. %</u>	<u>Type</u> <u>Wt. %</u>	<u>Type</u> <u>Wt. %</u>
Water	88.0	87.0	85.0
Sodium Metasilicate Pentahydrate	2.0	2.0	2.0
Miranol FBS	3.0	1.0	2.0
Alcodet HSC-1000	4.0	4.0	3.0
Cheelox BF-13	3.0	3.0	2.0
Rhodafac RA-600	-	3.0	-
Butoxyethanol	-	-	-
6.0			

Procedure

Blend ingredients in order listed and mix until uniform.

Physical Properties

Appearance	Clear, light yellow liquid		
pH, as is	12.6	11.5	12.55
Viscosity	<10 cps	<10 cps	<10 cps
Specific Gravity	0.978	1.013	1.016

Economical Pine Oil Hard-Surface Cleaner

Formula HS-0037

<u>Component</u>	<u>Wt. %</u>
Pine Oil	5.0
Rhodasurf BC-840	10.0
Water	85.0

Procedure

1. Add Rhodasurf BC-840 to pine oil. Mix well. Heat to approximately 35-40C to obtain homogeneous solution.
2. Add water and mix thoroughly.

Physical Properties

Appearance: Clear, water-white liquid
 pH, as is: 3.08
 Specific Gravity: 0.99
 Viscosity: <10 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Mild Abrasive Hard Surface Cleaner

A mild abrasive cleaner for consumer use. Effective on Stainless Steel, Porcelain and other hard surfaces.

<u>Part:</u>	<u>Ingredients:</u>	<u>Wt. %</u>
A	Deionized Water	30.00
	Calcite (<100 mesh)	50.00
	Mazox LDA	6.70
	Potassium Citrate	1.00
B	Calsoft F-90	3.30
	Deionized Water	9.00

Appearance: White pasty liquid

pH (as is): 7.0-8.0

Specific Gravity: 1.47

Procedure:

To a mixing vessel with sweep and scrape type agitation, charge the water and start agitation. Do not mix air into the product. Slowly add the Calcite followed by the Mazox LDA and the Potassium Citrate.

In a separate vessel, dissolve the Calsoft F-90 in the remaining water. When completely dissolved, add the first part of the mix. Again avoid mixing excess air into the system.

Notes:

This formulation is designed to be used as is by the consumer. It is a mild abrasive hard surface cleaner effective against most common soils. It can be used on stainless steel, porcelain and other hard surfaces.

In the manufacture of this product, care should be taken to avoid mixing air into the finished product. Being a pasty liquid, once air is entrained into the system, it is difficult and time consuming to remove.

SOURCE: Mazer Chemicals: Formulation CH-109

Non-Phosphate Household Hard-Surface Cleaner

All-Purpose Alkaline Cleaner for Sponge or Spray Application

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	79.75
Sodium Laureth Sulfate	2.50
Mazamide 80	0.50
Sodium Citrate	1.25
Sodium Metasilicate Pentahydrate	2.00
Macol 48	4.00
Deionized Water, Dye, etc.	Q.S.
pH (as is): 12.0-13.0	
Appearance: Clear, water-white liquid (without dye)	
Specific Gravity: 1.01	

Procedure:

Charge the first portion of water to a mixing vessel and start agitation. If product is to be colored, add the dye to reserved portion of the water in a separate vessel. Charge all remaining ingredients, including the dye solution, to the mixing vessel and mix until clear.

Notes:

This formulation is a non-phosphate version of formulation CH-102. This formulation is designed as a general purpose household cleaner. The product may be used with a sponge or may be used in a spray vessel.

Formula CH-106

Non-Phosphate Concentrated Household Hard-Surface Cleaner

Concentrated Pine Oil All-Purpose Cleaner

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	78.05
Macol TD-12	5.00
Macol TD-3	2.50
Mazamide 80	0.50
Macol 48	4.50
Pine Oil	0.20
Sodium Citrate	3.75
Sodium Metasilicate Pentahydrate	2.00
Sodium Xylene Sulfonate (40%)	3.50
pH (as is): 12.5-13.5	
Appearance: Clear, light yellow liquid	
Specific Gravity: 1.02	

Procedure:

Charge the water to a mixing vessel and start agitation. Charge the Macol TD-12, Macol TD-3, Mazamide 80 and Macol 48 and continue agitation. Charge the Pine Oil and mix 5 minutes. Charge the remaining ingredients and mix until clear and free of "fish eyes."

Notes:

This formulation is a non-phosphate version of formulation CH-103. This is a concentrated household hard-surface cleaner designed to be used at a dilution of 1-3 ounces per gallon.

Formula CH-107

SOURCE: Mazer Chemicals: Suggested Formulations

Pine Oil Cleaner Concentrate

<u>Ingredients:</u>	<u>% by Wt.</u>
Pine oil	20.0
Ninol 11-CM	9.0
Makon 12	5.0
Ammonyx LO	0.5
Bio-Soft S-100	2.0
Isopropanol	10.0
Water, D.I.	53.5

Mixing Procedure:

Combine pine oil, surfactants and IPA. Mix until clear. Add water slowly while under agitation. Mix until clear.

Properties:

Appearance: Clear yellow liquid
 Odor: Pine
 Viscosity @ 25C, cps: 50
 pH (as is): 8.1
 Density lbs/gal: 8.06
 Freeze/Thaw (3 cycles): Pass
 50C oven (1 week): Pass

Use Instructions:

Dilute 1-2 ozs into one gallon

Performance:

Gardner Straight Line Washability Test:
 Above formulation: 73.0% soil removed from tiles
 Commercial product: 55.5% soil removed from tiles

SOURCE: Stepan Co.: Formulation No. 208

Liquid Super Concentrate

	<u>% by Weight</u>
Water, D.I.	30.0
Tetrapotassium Pyrophosphate (60%)	25.0
Butyl Cellosolve	5.0
Witconate SXS Liquid	10.0
Varamide A-83	30.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Solids: 49.0%

SOURCE: Witco Corp.: Formula 502

8. Laundry Products

Anionic/Nonionic Heavy-Duty Laundry Detergent
Formula LY-0042

	<u>Wt. %</u>
Water	63
Calsoft F-90	5
Rhodasurf 25-7	7
Rhodacal A-246/L	15
Sodium Citrate	10
Brightener	Q.S.
Fragrance	Q.S.
Dye	Q.S.

Procedure

Heat water to 60C. Add Rhodasurf 25-7 slowly, with moderate agitation. Then, add Rhodasurf A-246/L and Calsoft F-90. Begin cooling and add remaining ingredients singly, with agitation to obtain uniform mixture, before making next addition.

Physical Properties

Appearance: Clear liquid, dyed to preference
pH, as is: 7.4
Specific Gravity: 1.09
Viscosity: 200 cps

Anionic/Nonionic Heavy-Duty Laundry Detergent
Formula LY-0043

	<u>Wt. %</u>
<u>Part A</u>	
Water	30.0
Na Citrate	8.0
Calsoft F-90	17.0
<u>Part B</u>	
Rhodasurf 25-7	8.0
MEA	2.0
SXS	6.0
<u>Part C</u>	
Colorant	0.02-1
Perfume	0.1-0.5
Water	Q.S.

Procedure

Dissolve Sodium Citrate in water by stirring at 45-50C and add Calsoft F-90. Mix Part "B" in the order listed. Add "A" to "B". Add colorant, perfume and water. Adjust pH to 11.0.

Physical Properties

pH: 11.0
pH (1% Solution): 9.50
Specific Gravity: 1.120
Viscosity: 75 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Anionic/Nonionic Heavy-Duty Laundry Detergent
Formula LY-0044

<u>Part A</u>	<u>Wt. %</u>
Water	30.0
Na Citrate	8.0
Calsoft F-90	17.0
<u>Part B</u>	
Rhodasurf 25-7	8.0
MEA	2.0
SXS	6.0
<u>Part C</u>	
Colorant	0.02-1
Perfume	0.1- 0.5
Water	Q.S.

Procedure

Dissolve sodium citrate in water by stirring at 45C-50C, add Calsoft F-90. Mix Part "B" in the order listed. Add "A" to "B". Add colorant, perfume and water. Adjust pH to 11.0.

Nonionic/Amphoteric Heavy-Duty Laundry Liquid
Formula LY-0045

	<u>Wt. %</u>
Water	Q.S.
Glycosides	20.0
Miranol FBS	7.0
MEA	2.0
Colorant	0.02-1
Perfume	0.1 -0.5

Procedure

Add the ingredients in the order listed. Mix well after each addition. Adjust pH to 11.0.

Physical Properties

pH: 11.0
pH (1% Solution): 9.50
Specific Gravity: 1.100
Viscosity: 300 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Cold Water Detergent
(For Wool and Delicate Fabrics)
Formula LY-0040

	<u>Wt. %</u>
Water	55.9
Miranol CS Conc.	10.0
Rhodapex ES-2	30.0
Alkamide DC-212	4.0
Fluorescent Whitening Agent	0.1

Procedure

Add ingredients in order listed. Heat to 50C and mix until clear.

Physical Properties

Appearance: Clear, yellow liquid
 pH, as is: 8.16
 Specific Gravity: 1.02
 Viscosity: 700 cps

Fine Fabric Detergent
Formula LY-0041

	<u>Wt. %</u>
Rhodacal DS-10	32.0
Sodium Hexametaphosphate	30.0
Sodium Bicarbonate	38.0
Optical Brightener	Q.S.

Procedure

Add the sodium bicarbonate and the sodium hexametaphosphate to the blender. Mix five minutes. Add the Rhodacal DS-10 with mixing. Add the optical brightener with mixing. Mix until uniform.

Physical Properties

Appearance: White, free-flowing powder
 pH, 1% Solution: 8.5

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Detergent for Colored Fabrics, Powder, Spray Mixing Process-A

Spray Mix:	%
Marlipal 24/939 or 013/939	10.0
Fragrance	0.2
Optical brightener	0.2

Builder Mix:	
Zeolite A	35.0
Sodium metasilicate pentahydrate	5.0
Sodium carbonate, dehydrated	15.0
Carboxymethyl cellulose	2.0
Polycarboxylate, e.g. Sokalan CP 5 powder	4.0
Sodium sulphate light	to 100

Active matter: 9.0%

Detergent for Colored Fabrics, Powder, Spray Mixing Process-B

Spray Mix:	%
Marlipal 24/30	2.0
Marlipal 24/90	4.0
Fragrance	0.2
Optical brightener	0.2

Builder Mix:	
Marlon ARL	10.0
Zeolite A	40.0
Sodium soap powder	4.0
Sodium metasilicate pentahydrate	5.0
Sodium carbonate, dehydrated	15.0
Polycarboxylate, e.g. Sokalan CP 5 powder	4.0
Polyvinylpyrrolidone, e.g. Sokalan HP 50	2.0
Sodium sulphate light	to 100

Active matter: 14.0%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

Detergent for Curtains, Medium Viscosity-A

	%
Marlinat DFK 30	20.0
Marlipal 24/70	15.0
Coconut fatty acid, potassium salt	5.0
Ethylenediamine tetraacetate 40	0.2
Balance water, fragrance, dyestuff, optical brightener, preservative	to 100

Active matter: 26.0%

Detergent for Curtains, Medium Viscosity-B

	%
Marlon PS 65	10.0
Marlox M 606/1	15.0
Ethylenediamine tetraacetate 40	0.2
Balance water, fragrance, dyestuff, optical brightener, preservative	to 100

Active matter: 20.7%

Manual-Wash Detergent, Foaming, Medium Viscosity-A

	%
Marlon PS 65	10.0
Marlipal 013/70	15.0
Marlamid DF 1218	2.5
Na cumene sulphonate, 40%	1.0
Ethanol*	1.5
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 24.0%

Manual-Wash Detergent, Foaming, Medium Viscosity-B

	%
Marlon A 365	18.5
Marlinat 242/28	12.0
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 15.3%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and
Cleaning Agents for Household Purposes

Detergent for Fine Fabrics-1
Liquid

Ingredients:

A	Fatty acid (Cocos + Olein, Prifac 7976)	3.00%
	KOH (85%)	0.60%
	H2O (40-50C)	41.90%
B	Hostapur SAS 60	23.30%
	Genapol ZRO liquid	25.00%
	Genapol UD-080	6.00%
C	Citric acid x 1H2O	0.20%

Manufacturing:

- I One after another, the components of B are added to A.
- II At last C is added.

Detergent for Fine Fabrics-2

Ingredients:

A	Fatty acid (Cocos + Olein, Prifac 7976)	4.00%
	KOH (85%)	0.80%
	H2O (40-50C)	63.00%
B	Hostapur SAS 60	8.00%
	Genapol UD-080	24.00%
C	Citric acid x 1H2O	0.20%

Manufacturing:

- I One after another, the components of B are added to A.
- II At last C is added.

SOURCE: Hoechst Aktiengesellschaft: Detergents and Cleaning Agents: Guide Formulations

Enzymatic Heavy-Duty Laundry Detergent
Formula LY-0046

<u>Part A</u>	<u>Wt. %</u>
Water	10.0
Citrate	5.0
Calsoft F-90	8.0
<u>Part B</u>	
Rhodasurf 25-7	6.0
MEA	2.0
TEA	2.0
SXS	3.0
Rhodapex NA 61	8.0
<u>Part C</u>	
Na Formate	1.2
Calcium Chloride	0.2
Enzymes	0.4
Colorant	0.02-1
Perfume	0.1 -0.8
Water	Q.S.

Procedure

Dissolve sodium citrate in water by stirring at 45-50C, add Calsoft F-90. Mix Part "B" in the order listed. Add "A" to "B". Add sodium formate and calcium chloride. Cool to room temperature. Add the enzymes. Add colorant, perfume and water. Adjust pH to 10.0.

Physical Properties

pH: 10.0
pH (1% Solution): 8.8
Specific Gravity: 1.100
Viscosity: 100 cps

Non-Phosphate Laundry Powder
Formula LY-0048

	<u>Wt. %</u>
Sodium Carbonate	50.0
Igepal CO-630	12.0
Sodium Silicate	12.0
Sodium Sulfate	24.5
Carboxymethylcellulose	1.0
Optical Brightener	0.5

Procedure

Add the sodium carbonate to the mixer. Spray the Igepal CO-630 onto the sodium carbonate. Add the remaining ingredients in the order listed. Mix until a homogeneous, free-flowing product results.

Physical Properties

Appearance: White, free-flowing powder
pH, 1% Solution: 11.0

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Fabric Pretreatment Spritz

<u>Ingredients:</u>	<u>%W/W</u>
Neodol 25-7	9.75
Neodol 25-3	5.25
Versaflex 207 (25%)	20.00
Sodium Xylene Sulfonate (40%)	15.00
EDTA, Disodium Salt	0.50
Water, Dye, Perfume, and Enzymes	q.s.

Procedure:

1. Mix melted Neodol 25-7 and Neodol 25-3.
2. Add sodium xylene sulfonate and mix.
3. Add water and Versaflex 207, mix, and cool.
4. Add EDTA, dye, perfume, and enzymes.

Reference #8069:21

Low VOC Pump Fabric Antistatic Spray

<u>Ingredients:</u>	<u>%W/W</u>
Versaflex 2004 (30%)	5.00
Ethanol	10.00
Propylene Glycol	0.50
Preservative, Water, and Fragrance	q.s.

Procedure:

1. Mix Versaflex 2004 and water.
2. Add ethanol and mix.
3. Add propylene glycol, preservative, and fragrance, and mix.

Reference #8069:97

SOURCE: National Strach and Chemical Corp.: Suggested Formulations

Laundry Pre-Spotter and Stain Remover

	<u>% by Weight</u>
Water	83.0
Sodium Meta Silicate (Anhydrous)	2.0
Detergent Concentrate 840	15.0

Procedure:

Blend ingredients in order listed. Add color, fragrance and preservative as required.

SOURCE: Mona Industries, Inc.: Suggested Formulation

Fabric Softener-1

Ingredients:

A	H2O (50-60C)	ad 100.00%
B	Prapagen WK	6.70%
C	MgCl2 (10% b.w.)	0.10%
D	Perfume	0.20%
	Dye	q.s.

Fabric Softener-2

Ingredients:

A	Genamin S-250	2.00%
	H3PO4 (1 M; 9,5% b.w.)	1.00%
	H2O (50-60C)	ad 100.00%
B	Prapagen WK	17.30%
C	MgCl2 (10% b.w.)	3.00%
D	Perfume	0.60%
	Dye	q.s.

Fabric Softener-3

Ingredients:

A	Genamin S-250	0.90%
	H3PO4 (1 M; 9,5% b.w.)	0.45%
	H2O (50-60C)	ad 100.00%
B	Prapagen WK	13.80%
	Polyglykol 400	3.70%
C	MgCl2 (10% b.w.)	1.00%
D	Perfume	0.60%
	Dye	q.s.

Manufacturing:

- I One after another, the components of B are added to A.
- II At 40C, adjust the viscosity with C (ca. 100-150 mPas).
- III At 30C the components of D are added.

Application:

1,0-2,0 g active ingredient/kg textile

SOURCE: Hoechst Aktiengesellschaft: Detergents and Cleaning Agents: Guide Formulations

Fabric Softener, Low Viscosity-A

Marlosoft IQ 90	%
Balance water, fragrance, dyestuff	5.6
	to 100
Active matter: 5.0%	

Fabric Softener, Low Viscosity-B

Marlosoft IQ 90	%
Balance water, fragrance, dyestuff	8.3
	to 100
Active matter: 7.5%	

Fabric Softener Concentrate, Low Viscosity-A

Marlosoft IQ 90	%
Calcium chloride, 25% (approx.)	11.1
Balance water, fragrance, dyestuff	0.1
	to 100
Active matter: 10.0%	
Formulation A: double concentrate	

Fabric Softener Concentrate, Low Viscosity-B

Marlosoft IQ 90	%
Calcium chloride, 25% (approx.)	16.7
Balance water, fragrance, dyestuff	1.1
	to 100
Active matter: 15.0%	
Formulation B: triple concentrate	

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

Heavy-duty Detergent, Powder, Spray Mixing Process-A

Spray Mix:	%
Marlipal 24/70 or 013/70	4.0
Optical brightener	0.2
Ethylenediamine tetraacetate, 40%	0.8
Fragrance	0.2
Builder Mix:	
Marlon ARL	8.0
Sodium soap powder	2.8
Zeolite A	25.0
Sodium metasilicate pentahydrate	5.0
Sodium perborate tetrahydrate	20.0
Tetraacetyethylenediamine (TAED)	3.0
Sodium carbonate	10.0
Polycarboxylate, e.g. Sokalan CP 5 powder	4.0
Carboxymethyl cellulose	1.0
Sodium sulphate light, enzymes	to 100

Active matter: 13.2%

Heavy-Duty Detergent, Powder, Spray Mixing Process-B

Spray Mix:	%
Marlipal 24/70 or 013/70	4.0
Optical brightener	0.2
Ethylenediamine tetraacetate, 40%	0.8
Fragrance	0.2
Builder Mix:	
Marlon ARL	8.0
Sodium soap powder	3.0
Sodium tripolyphosphate	30.0
Sodium disilicate	9.0
Sodium perborate tetrahydrate	20.0
Tetraacetyethylenediamine (TAED)	3.0
Carboxymethyl cellulose	1.0
Sodium sulphate light, enzymes	to 100

Active matter: 13.4%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

Heavy-Duty Detergent, Powder, Spray Mixing Process-A

Spray Mix:	%
Marlupal 013/939 or 24/939	10.0
Fragrance	0.2
Ethylenediamine tetraacetate, 40%	1.0
Optical brightener	0.2

Builder Mix:	
Zeolite A	30.0
Sodium metasilicate pentahydrate	5.0
Magnesium silicate	1.0
Sodium perborate tetrahydrate	25.0
Tetraacetylenediamine (TAED)	3.0
Sodium carbonate	15.0
Carboxymethyl cellulose	1.5
Sodium sulphate light, enzymes	to 100

Active matter: 9.0%

Heavy-Duty Detergent, Powder, Spray Mixing Process-B

Spray Mix:	%
Marlupal 013/939 or 24/939	10.0
Fragrance	0.2
Optical brightener	0.2

Builder Mix:	
Sodium tripolyphosphate	28.0
Sodium disilicate	5.0
Magnesium silicate	1.0
Sodium perborate tetrahydrate	25.0
Tetraacetylenediamine (TAED)	3.0
Carboxymethyl cellulose	1.0
Sodium sulphate light, enzymes	to 100

Active matter: 9.0%

Liquid Heavy-Duty Detergent, Built Type, High Viscosity-A

	%
Marlon PS 65	10.0
Marlupal 013/30	5.0
1,2-Propylene glycol*	5.0
Citric acid	2.0
Zeolite A, 50% slurry	45.0
Balance water, fragrance, dyestuff, optical brightener, enzymes, preservative	to 100

Active matter: 11.5%

*further products of Huls AG

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

Heavy Duty Liquid Laundry Detergent
Type DN

<u>Ingredients:</u>	<u>Parts by Weight</u>
Stepan Bio Soft D-62 (anionic surfactant)	7.0
Neodol 25-7 (nonionic surfactant)	16.0
Propylene glycol	7.0
Ethyl alcohol	5.0
Sodium Citrate (Haarman & Reimer)	5.0
Sodium xylene sulfonate	10.0
Sodium borate (borax)	1.0
Triethanolamine (TEA) or sodium hydroxide	to pH 9.5

Dissolve the Sodium Citrate and sodium borate in approximately 20 ml water. Apply heat if necessary to dissolve. Combine the surfactants, propylene glycol and ethyl alcohol. Add the Sodium Citrate and sodium borate solution to the surfactants mixture. Add the sodium xylene sulfonate. Adjust the pH to 9.5 using TEA or dilute sodium hydroxide. Bring the volume of the mixture to 100 ml using water.

If an enzyme detergent is desired, the following should be added:

Sodium borate (borax) add an additional	2.0
Calcium chloride	0.1
Protease	0.6

Dissolve the Sodium Citrate, sodium borate and calcium chloride in water. Apply heat if necessary to dissolve. Combine the surfactants, propylene glycol and ethyl alcohol. Add the Sodium Citrate, sodium borate and calcium chloride solution to this mixture. Add sodium xylene sulfonate. Adjust the pH to 8.0 with TEA or dilute sodium hydroxide. Add the Protease. Bring the volume of the mixture to 100 ml using water.

The addition of fragrance, dye, optical brightener, anti-redeposition agent, corrosion inhibitor, etc., is optional.

SOURCE: Haarman & Reimer Corp.: Suggested Formulation

Built Formulation #1

<u>Ingredient:</u>	<u>Weight, %</u>
Water	68%
Na3NTA	1%
Na Gluconate	1%
45% KOH	10%
42 Silicate N	10%
Glycol Ether	5%
Nonionic Surfactant	2%
Amphoteric	3%

Both the Amphoteric SC and the competitive imidazoline coupled the formulation together with 3% of amphoteric.

SOURCE: Tomah Products, Inc.: Suggested Formulation

Heavy Duty Liquid Laundry Detergent
Type TA

<u>Ingredients:</u>	<u>Parts by Weight</u>
Neodol 25-7 (nonionic surfactant)	5.0
Neodol 25-3S (anionic surfactant)	10.0
Sodium lauryl sulfate (anionic surfactant)	12.0
Stepan Bio Soft D-62 (LAS-anionic surfactant)	8.0
Triethanolamine (TEA)	5.0
Propylene glycol	7.0
Potassium Citrate (Haarman & Reimer Corp.)	6.0
Ethyl alcohol	7.0
Calcium chloride	0.1
Sodium borate (borax)	3.0
Protease	0.6
Water	q.s. to 100 parts

Dissolve the Potassium Citrate, calcium chloride and sodium borate in approximately 20 ml water. Apply heat if necessary to dissolve. Combine the surfactants, TEA, propylene glycol and ethyl alcohol. Add the Potassium Citrate, calcium chloride and sodium borate solution. Adjust the pH of the solution to 8.0 with TEA or dilute sodium hydroxide. Add the Protease. Bring the volume of the mixture to 100 ml using water.

The addition of fragrance, dye, optical brightener, anti-redeposition agent, corrosion agent, corrosion inhibitor, etc., is optional.

SOURCE: Haarman & Reimer Corp.: Suggested Formulation

Liquid Laundry Detergents

<u>Ingredients:</u>	<u>Weight%</u>
Water	72
Glucopon 600CSUP (50%)	10
Ethanol	3
Trycol 5963	15

<u>Ingredients:</u>	<u>Weight%</u>
Water	32
Sodium Citrate	5
Sulfotex SXS	5
Glucopon 600CSUP (50%)	15
Ethanol	5
Sulfotex 6040 S (59%)	38

Add in the order listed, dissolving each ingredient completely. Use moderate agitation and incorporate colors and fragrances as required.

**SOURCE: Henkel Corp.: CD Division: Glucopon Surfactants:
Suggested Formulations**

Heavy Duty Liquid Laundry Detergent
Type WA

<u>Ingredients:</u>	<u>Parts by Weight</u>
Stepan Bio Soft D-62 (LAS-anionic surfactant)	28.0
Neodol 25-7 (nonionic surfactant)	7.0
Sodium xylene sulfonate	12.0
Triethanolamine (TEA)	2.0
Sodium Citrate (Haarman & Reimer Corp.)	12.0
Water	q.s. to 100 parts

Dissolve Sodium Citrate in approximately 20 ml water. Combine the surfactants, sodium xylene sulfonate and TEA. Add the Sodium Citrate. Adjust the pH of the solution to 11 using dilute sodium hydroxide. Bring the volume of the mixture to 100 ml using water.

If an enzyme detergent is desired, the following should be added:

Sodium borate (borax)	3.0
Calcium chloride	0.1
Propylene glycol	7.0
Protease	0.6

Dissolve the sodium borate, calcium chloride and Sodium Citrate in water. Apply heat if necessary to dissolve. Combine the surfactants, sodium xylene sulfonate, TEA and propylene glycol. Add the sodium borate, Sodium Citrate and calcium chloride solution to this mixture. Adjust the pH to 8.0 with TEA or dilute sodium hydroxide. Add the Protease. Bring the volume of the mixture to 100 ml using water.

The addition of fragrance, dye, optical brightener, anti-redeposition agent, corrosion inhibitor, etc., is optional.

SOURCE: Haarman & Reimer Corp.: Suggested Formulation

Built Formulation #2

<u>Ingredient:</u>	<u>Weight, %</u>
Water	79%
Na Metasilicate pentahydrate	1%
STPP	10%
Nonionic surfactant	5%
Amphoteric surfactant	5%

Both the Amphoteric SC and the competitive amphoteric coupled the formulation together with 5% of amphoteric.

SOURCE: Tomah Products, Inc.: Suggested Formulation

Liquid Heavy-Duty Detergent, Low Viscosity-A

	%
Marlon PS 65	20.0
Marlipal 013/89	17.2
Caustic potash, 50% (approx.)*	3.9
Coconut fatty acid	10.0
Triethanolamine R*	5.0
1,2-Propylene glycol*	3.0
Ethanol*	8.0
Phosphonate, e.g. Dequest 2060 S	1.5
Sodium formiate*	1.0
Balance water, fragrance, dyestuff, optical brightener, enzymes, preservative	to 100

Active matter: 45.0%

Liquid Heavy-Duty Detergent, Low Viscosity-B

	%
Marlon PS 65	20.0
Marlipal 013/129	3.9
Marlox FK 64	12.0
Caustic potash, 50% (approx.)*	3.9
Coconut fatty acid	10.0
Triethanolamine R*	5.0
1,2-Propylene glycol*	3.0
Ethanol*	8.0
Phosphonate, e.g. Dequest 2060S	1.5
Sodium formiate*	1.0
Balance water, fragrance, dyestuff, optical brightener, enzymes, preservative	to 100

Active matter: 45.0%

Liquid Heavy-Duty Detergent, Built Type, High Viscosity-B

	%
Marlon PS 65	10.0
Marlipal 013/30	5.0
Citric acid	1.0
Zeolite A, 50% slurry	45.0
Balance water, fragrance, dyestuff, optical brightener, enzymes, preservative	to 100

Active matter: 11.5%

* further products of Huls AG

SOURCE: Huls America, Inc.: Basic Formulations of Detergents
and Cleaning Agents for Household Purposes

Light-Duty Detergent, Powder, Spray Mixing Process-A

Spray Mix:	%
Marlipal 013/939 or 24/939	5.0
Marlamid DF 1218	1.0
Fragrance	0.2

Builder Mix:	
Zeolite A	40.0
Sodium disilicate	3.0
Carboxymethyl cellulose	1.0
Sodium sulphate light	34.8

Post Mix:	
Marlon ARL	15.0

Active matter: 17.5%

Light-Duty Detergent, Powder, Spray Mixing Process-B

Spray Mix:	%
Marlipal 013/939 or 24/939	3.0
Fragrance	0.2

Builder Mix:	
Zeolite A	45.0
Sodium disilicate	5.0
Carboxymethyl cellulose	1.0
Sodium sulphate light	22.8

Post Mix:	
Marlon ARL	18.0

Active Matter: 17.1%

**Liquid Light-Duty Detergent, with Incorporated Softener,
Low Viscosity-A**

	%
Marlipal 24/99	15.0
Marlox FK 64	5.0
Marlosoft IQ 90	5.0
Ethanol*	10.0
Balance water, fragrance, dyestuff	to 100

Active Matter: 23.0%

*further products of Huls AG

**SOURCE: Huls America, Inc.: Basic Formulations of Detergents
and Cleaning Agents for Household Purposes**

Liquid Light-Duty Detergent, Low Viscosity-A

	%
Marlon PS 65	20.0
Marlinat 242/28	12.0
Marlamid DF 1218	3.0
Coconut fatty acid	4.0
Caustic potash, 50% (approx.)*	1.4
Ethylenediamine tetraacetate, 40%	0.2
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 23.5%

Formulation A for machine-wash

Liquid Light-Duty Detergent, Low Viscosity-B

	%
Marlinat 242/28	40.0
Marlamid DF 1218	3.0
Marlamid PG 20	3.0
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 16.2%

Formulation B for manual-wash

**Liquid Light-Duty Detergent, with Incorporated Softener,
Low Viscosity-B**

	%
Marlipal 24/99	5.0
Marlox FK 64	5.0
Ampholyt JB 130	25.0
Marlosoft IQ 90	5.0
Balance water, fragrance, dyestuff	to 100

Active matter: 21.5%

* further products of Huls AG

SOURCE: Huls America, Inc.: Basic Formulations of Detergents
and Cleaning Agents for Household Purposes

Industrial Laundry Two-Part Systems
Formula LY-0052

Uniforms (Petroleum Greases and Oils)

<u>Part A</u>	<u>Wt. %</u>
Igepal CO-660	8
Calsoft F-90	2
Water	90
 <u>Part B</u>	
Sodium Silicate ($\text{SiO}_2/\text{Na}_2\text{O}$ 1.6-2.5)	100

Hotel/Linen Supply (Animal and Vegetable Grease)

<u>Part A</u>	<u>Wt. %</u>
Igepal CO-660	10
Calsoft F-90	2
Water	88
 <u>Part B</u>	
Potassium Hydroxide (45%)	85
STPP, TKPP or KTPP	15

Industrial Laundry Powder
Uniforms
Formula LY-0050

	<u>Wt. %</u>
Sodium Carbonate	52.5
Igepal CO-660	15
Sodium Tripolyphosphate	20
Sodium Metasilicate	12
Optical Brightener	0.5

Procedure

Add the sodium carbonate to the mixer. Spray on the Igepal CO-660. Add the remaining ingredients in the order listed. Mix until uniform.

Physical Properties

Appearance: White, free-flowing powder
pH, 1% Solution: 11.4

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Laundry Liquids

Calsuds or Calsoft based products remove ground-in dirt and grease in heavy fabrics and gently clean delicate knits in cold water. They inhibit static build-up and provide lubricity, fulling and softening.

"Fine Care" Fabric Detergents

Pilot Formula #LDY-003-01

	<u>% by Weight</u>
Calsuds CD-6	19.90
Calfoam ES-303	15.15
Pilot SXS-40	10.20
Calsoft LAS-99	4.96
Water	49.79

Pilot Formula #LDL-003-01

	<u>% by Weight</u>
Calsuds CD-6	20.00
Calfoam ES-303	15.00
Pilot SXS-40	10.00
Calsoft LAS-99	5.00
Water	50.00
Citric Acid	Q.S. pH 7
Perfume and Color	Q.S.
Preservative	Q.S.

Heavy Duty Laundry Liquids

Pilot Formula #HDL-004-01

	<u>% by Weight</u>
Water	36.60
50% NaOH	6.40
Diethanolamine	7.00
Propylene Glycol	5.00
Calsoft LAS-99	40.00
Caloxylate N-9	5.00

Pilot Formula #HDL-005-01

	<u>% by Weight</u>
Water	30.40
50% NaOH	4.60
Diethanolamine	5.00
Pilot SXS-40	25.00
Calsoft LAS-99	30.00
Caloxylate N-9	5.00

SOURCE: Pilot Chemical Co.: Household Cleaner Formulations

Laundry Powder Detergent
Formula LY-0047

	<u>Wt. %</u>
Sodium Carbonate	44.0
Calsoft F-90	14.0
Rhodapex NA-61	6.0
Rhodasurf 25-7	2.0
Sodium Metasilicate Pentahydrate	4.0
Sodium Sulfate	10.0
Zeolite	18.0
Sodium Perborate	2.0
Enzymes can be added	
Dye	-
Perfume	-

Procedure

Add the sodium carbonate to the mixer. Spray on the Rhodapex NA-61 and the Rhodasurf 25-7. Add the remaining ingredients in the order listed and mix until uniform.

Physical Properties

Appearance: White, free-flowing powder, dyed to preference.
pH, 1 % Solution: 11

Industrial Laundry One-Shot Liquid
Formula LY-0049

	<u>Wt. %</u>
Water	69
Igepal CO-630	3
Igepal CO-710	3
Cheelox BF-13	10
Potassium Hydroxide (45%)	10
Miranol FBS	5

Procedure

Add the ingredients in the order listed. Mix until uniform.

Physical Properties

Appearance: Clear liquid
pH, as is: 13.0
pH, 1% solution: 11.8
Specific Gravity: 1.06
Viscosity: <10 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Liquid Heavy Duty Detergent HDLD
Soap based

Ingredients:

A	Genapol OA-080	12.00%
	Fatty acid (2/3 oleic, 1/3 coco)	14.00%
	KOH (85%)	3.50%
	1,2 Propyleneglycol	5.00%
B	Tinopal CBS-X	0.10%
	Water (50-60C)	39.40%
C	Hostapur SAS 60	17.00%
	Trisodium-citrate x 2H2O	5.00%
D	Ethanol	3.00%
	Savinase	0.50%
	Alcalase	0.20%
	Termamyl	0.30%
	Parfum	0.20%
	Farbstoff	0.10%

Manufacturing:

- I Dissolve B in A.
 II One after another, the components of C are added to I.
 III At 25C, the components of D to II.

Liquid Detergent "FSL" A

Ingredients:

A	Genapol OA-080	12.00%
	Fatty acid (Prifac 7976)	14.00%
	KOH (85%)	2.60%
	Triethanolamine	2.00%
	1,2 Propyleneglycol	5.00%
B	Tinopal CBS-X	0.20%
	Water (50-60C)	34.20%
C	Hostapur SAS 60	17.00%
	Trisodium-cirate x 2H2O	5.00%
	Dequest 2066	4.00%
D	Ethanol	3.00%
	Savinase	0.50%
	Alcalase	0.20%
	Termamyl	0.30%
	Perfume	q.s.
	Dye	q.s.

Manufacturing:

- I Dissolve B in A.
 II One after another, the components of C are added to I.
 III At 25C, the components of D to I.

SOURCE: Hoechst Aktiengesellschaft: Detergents and Cleaning Agents: Guide Formulations

Thick Bleach-1
Liquid

Ingredients:

A	Genaminox MY	12.000%
	Medialan LD	2.500%
	NaOH (100%)	1.000%
B	Water	34.475%
C	Sodiumhypochlorite - solution (150 g/L active chlorine)	50.000%
D	Perfume (e.g. Hypofresh)	0.025%

Manufacturing:

- I B is added to A.
- II Stir C to I.
- III At last D is added.

Viscosity (Brookfield RVT, sp.4, 22C, mPas): 4800

Thick Bleach-2

Ingredients:

A	Genaminox MY	6.000%
	Medialan LD	1.000%
	NaOH (100%)	1.000%
B	Water	41.975%
C	Sodiumhypochlorite - solution (150 g/L active chlorine)	50.000%
D	Perfume (e.g. Hypofresh)	0.025%

Manufacturing:

- I B is added to A.
- II Stir C to I.
- III At last D is added.

Viscosity (Brookfield RVT, sp.4, 22C, mPas): 600

**SOURCE: Hoechst Aktiengesellschaft: Detergents and Cleaning
Agents: Guide Formulations**

Wool Detergent, Medium Viscosity-A

	%
Marlon PS 65	18.0
Marlinat 242/28	28.0
Marlamid DF 1218	1.0
Balance water, dyestuff, fragrance, preservative, sodium chloride	to 100

Active matter: 20.5%

Wool Detergent, Medium Viscosity-B

	%
Marlon PS 65	20.0
Marlinat SRN 30	20.0
Dionil OC	1.0
Balance water, dyestuff, fragrance, preservative, sodium chloride	to 100

Active matter: 20.0%

Wool Detergent, Medium Viscosity-A

	%
Marlon AS3	12.0
Marlinat 242/28	18.0
Ammonium hydroxide, 25%	3.0
Urea	3.0
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 19.0%

Wool Detergent, Medium Viscosity-B

	%
Marlon A 375	15.6
Marlinat 242/28	28.0
Marlamid DF 1218	1.0
Balance water, fragrance, dyestuff, preservative, sodium chloride	to 100

Active matter: 20.5%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents
and Cleaning Agents for Household Purposes

9. Metal Cleaners and Polishes

Aluminum Cleaner/Brightener
Acid Cleaner for Aluminum Wheels and Trailers

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	83.00
Phosphoric Acid (85%)	6.00
Citric Acid (50%)	8.00
Nitric Acid (70%)	1.00
Avanel S-70	2.00

pH (as is): <2.0

Appearance: Clear, white-water liquid

Procedure:

Charge the water to an appropriate mixing vessel. Charge remaining ingredients in the order listed while continuing agitation.

WARNING: Use all manufacturer precautionary safety measures when handling concentrated acid solutions.

Formula CM-101

Aluminum Smut Cleaner
High Temperature Dilutable Acid Concentrate

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	19.00
Citric Acid (50%)	50.00
Gluconic Acid (50%)	25.00
Avanel N-1525-90	3.00
Avanel S-70	1.50
Ammonium Bifluoride	1.50

pH (as is): <2.0

Appearance: Clear, water-white to light-yellow liquid

Specific Gravity: 1.18

Procedure:

Charge the water and two acids under agitation. Continue agitation and add the Avanel surfactants; mix until dissolved. Add Ammonium Bifluoride and mix until dissolved.

Use Directions:

Use in pressure wash at a rate of 2-4 ounces per gallon. Use temperature of dilution is normally 140-150F.

Notes:

This formula was developed to remove stamping oil smut from aluminum cans. Cans should be thoroughly rinsed after cleaning.

Formula CM-104

SOURCE: Mazer Chemicals: Suggested Formulations

Aluminum Cleaner Concentrate

	<u>% by Weight</u>
Water	75
Sodium Metasilicate (Anhydrous)	10
Tetrapotassium Pyrophosphate (Powder)	5
Mona NF-10	10

Procedure:

Dissolve sodium metasilicate and tetrapotassium pyrophosphate in water with mixing, then add Mona NF-10.

Typical Properties:

Appearance: Clear liquid
Cloud Point: 88C

Recommended Use Dilution:

1 to 4 oz/gal.

Formula F-498

Aluminum Wash

	<u>% by Weight</u>
Water	88
Sodium Metasilicate (Anhydrous)	2
Tetrasodium Pyrophosphate (Powder)	3
Butyl Carbitol	2
Mona NF-10	5

Procedure:

Dissolve sodium metasilicate and tetrasodium pyrophosphate in water, then add Butyl Carbitol and Mona NF-10.

Typical Properties:

Appearance: Clear liquid
pH: 12.8

Recommended Use Dilution:

1:10 with water

Formula F-499

SOURCE: Mona Industries, Inc.: Suggested Formulations

Cleaners and Cleaning Solutions

Metal Cleaning-Alkaline

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol 22 Surfactant	10.0
Sodium Carbonate	40.0
Sodium Metasilicate	20.0
Sodium Hydroxide	10.0

Grind the powders together and add the Aerosol 22 slowly while grinding.

Metal Cleaning-Acid

<u>Ingredients:</u>	<u>% by Weight</u>
Dowanol EB	6.0
Phosphoric Acid (85%)	7.0
Aerosol 22 Surfactant	0.3
Water	86.7

Metal Cleaning-Paint Removal

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol C-61 Surfactant	20.0
Sodium Carbonate	40.0
Sodium Metasilicate	30.0
Sodium Hydroxide	10.0

Grind the powders together and add the Aerosol C-61 slowly while mixing.

Metal Cleaning-Rust Removal

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OS Surfactant	10.0
Sodium Bifluoride	75.0
Sodium Tetraphosphate	10.0
Sodium Bisulfite	15.0

SOURCE: Cytac Industries Inc.: Suggested Formulations

Copper Cleaning

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol A-102 Surfactant	2.0
Sodium Chloride	5.0
Citric Acid	5.0
Bentonite	22.0
Water	66.0

Aluminum Cleaning - Acid

<u>Ingredients:</u>	<u>% by Weight</u>
Phosphoric Acid (85%)	15.0
Hydrofluoric Acid (48%)	2.0
Glacial Acetic Acid	3.0
Aerosol OS Surfactant	5.0
Water	75.0

Aluminum Cleaning-Brightening

<u>Ingredients:</u>	<u>% by Weight</u>
Phosphoric Acid (85%)	47.2
Aerosol 22 Surfactant	1.0
Aerosol OS Surfactant	1.0
Butyl Cellosolve	16.0
Water	34.8

Aluminum Aircraft-Brightener (U.S. Patent 2,687,346)

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OS Surfactant	3.0
Aerosol 22 Surfactant	9.0
Citric Acid	5.0
Ammonium Bifluoride	3.0
Benzenesulfonic Acid	10.0
Phosphoric Acid (85%)	2.4
Water	26.4-52.8

SOURCE: Cytec Industries Inc.: Suggested Formulations

Electrocleaner

<u>Components:</u>	<u>% by Weight</u>
Water	2-8
Burco BSGH-400	1-4
Burco NPS-225	0.75-3
Burco TME	0.25-1
50% NaOH	To 100% Total

Basic formulating guidelines:

- 1) Ratio of Burco NPS-225/Burco TME should be 3/1.
- 2) The level of Burco BSGH-400 is preferably equal to the sum of Burco NPS-225 and Burco TME.
- 3) The water charge should be equal to the sum of Burco BSGH-400, Burco NPS-225 and Burco TME.
- 4) Premix all components but NaOH, then add NaOH with stirring.

This formulation will provide moderate foam levels and is suitable for use as an electrocleaner, food plant cleaner or other applications where high caustic concentrates are used. For reduced foam levels as in an alkaline spray cleaner, replace Burco NPS-225 with Burco HCS-50NF.

Moderate Alkalinity, Soil Splitting Soak Cleaner

<u>Components:</u>	<u>% by Weight</u>
Water	70
Sodium Metasilicate (Pentahydrate)	5
Trisodium Phosphate (Crystals)	10
Burco ADS-40	5
Burco EHS	5
Burco TME	5

Procedure:

Add components in the order listed. Stir until homogeneous between each addition.

SOURCE: Burlington Chemical Co., Inc.: Suggested Formulations

High-Foaming Acid Scrubber*
Formula BC-0003

	<u>Wt. %</u>
Miranol FBS	5.0
Igepal CO 630	2.0
Sulfamic Acid	4.0
Glycolic (Hydroxyacetic) Acid (70%)	4.0
Butoxyethanol	3.0
Water	82.0

Procedure

Add the water, sulfamic and glycolic acids. Mix until dissolved. Add the remaining ingredients, with mixing. Mix until uniform.

Physical Properties

Appearance: Clear liquid
pH, as is: 1.5
Specific Gravity: 1.027
Viscosity: <10 cps

*Suitable for applications with a trigger-type sprayer.

Acid Cleaner
Formula BC-0004

	<u>Wt. %</u>
Rhodafac RE-610	3.0
Igepal CO-630	4.0
Phosphoric Acid, 75%	10.0
Water	83.0

Procedure

Add phosphoric acid to water and heat with agitation to 50C. with rapid but smooth agitation. Slowly blend in Rhodafac RE-610 and Igepal CO-630. Once system is completely uniform, cool with stirring to 40-45C, and package.

Physical Properties

Appearance: Slightly hazy liquid
pH, as is: 1.6
Specific Gravity: 1.03
Viscosity: 20 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Metal Cleaner and Degreaser

<u>Ingredients:</u>	<u>% by Weight</u>
Monoethanolamine	5.0
Sodium DDBSA, 35%	12.0
Sandoxylate SX 408	5.0
Sodium EDTA	0.5
Water	58.5
Oleic Acid	10.0
D-Limonene	3.0
Butyl Cellosolve	6.0

Procedure:

Charge monoethanolamine and water to vessel. With stirring, add DDBSA. Mix in Sandoxylate SX 408, and EDTA. Warm to 50C, add the oleic acid slowly, while increasing the agitation. When the oleic acid has completely reacted, add D-Limonene and Butyl Cellosolve. Cool with stirring to 40C. Bottle.

Properties:

pH (as is): 10.0

Viscosity: Approx. 100 cps Brookfield LVT, Spindle #2 @ 12 rpm

% Solids: 26%

SOURCE: Sandoz Chemicals Corp.: Formulation HHG-10

Thickened Clear Degreaser Concentrate

	<u>% by Weight</u>
Water, D.I.	42.5
DeSonic 9N	25.0
Varonic DM55	12.5
d'Limonene	20.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 363

Solids: 37.5%

pH: 5.9

SOURCE: Witco Corp.: Formula 805

Stainless Steel Cleaner-A

	%
Marlupal KF	1.0
Marlophor CS acid	10.0
Solvent BG*	5.0
Balance water, fragrance, dyestuff, preservative	to 100
Active matter: 1.0	
Viscosity: liquid	

Stainless Steel Cleaner-B

	%
Marlupal 013/99	6.0
Aluminum oxide FPTO	25.0
Isoparaffin, e.g. Shellsol T	40.0
Balance water, fragrance, dyestuff, preservative	to 100
Active matter: 5.4	
Viscosity: medium	
Formulation B with abrasive	

Silver Polish, Liquid-A

	%
Marlupal KF	0.5
Thiourea	6.0
Phosphoric acid, 85%	2.0
Isopropanol*	3.0
Balance water	to 100
Active matter: 0.5%	

Silver Polish, Liquid-B

	%
Marlazin L 10	1.5
Marlophor CS acid	5.0
Thiourea	2.5
Phosphoric acid, 85%	20.0
Balance water	to 100
Active matter: 1.5%	

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

10. Oven, Grill and Hot Plate Cleaners

Pump Spray Oven Cleaner

<u>Ingredient:</u>	<u>Percent by Weight</u>
Part A:	
Vegetable gum (Veegum T)	1.2
Xanthan gum	0.4
Water	78.9
Part B:	
Liquid Citric Acid--50% (Haarman & Reimer Corp.)	7.0
Sodium hydroxide solution 50%	4.5
Part C:	
Amphoteric surfactant	8.0

Prepare Part A by slowly adding vegetable gum and xanthan gum to the water. Continue agitating until smooth dispersion is obtained.

Prepare Part B (trisodium citrate) by adding the citric acid to a separate tank and neutralizing it with the sodium hydroxide solution. The neutralization should be done slowly and continuously under agitation, as the reaction is highly exothermic.

Add Part B to Part A, and finally Part C.

The formulation has the consistency of a fluid gel. It may be used in either warm or cold ovens. The spraying should be done at a distance of from 10 to 15 inches. Clean by wiping after at least 10 minutes of reaction time.

SOURCE: Haarman & Reimer Corp.: Suggested Formulation

Caustic Oven Cleaner

<u>Ingredients:</u>	<u>% by Weight</u>
(1) Korthix H	2.0
(2) Kelzan	0.3
(3) Deionized Water	86.7
(4) Sodium Hydroxide (50%)	10.0
(5) Avanel S-74	1.0

Procedure:

Add (1) to (3) and mix at high speed. After (1) is well dispersed, add (2) and (5). Reduce speed and add (4) carefully and slowly.

Follow recommended handling practices of the suppliers of each product used.

SOURCE: Kaopolite, Inc.: Suggested Formulation

Oven/Grill Cleaner

	<u>Wt%</u>
Water	78
Tetrasodium EDTA	2
Sodium Hydroxide (50%)	15
Glucopon 425 CS	5

SOURCE: Henkel Corp., CD Division: Suggested Formulation

11. Polishes, Coatings and Finishes

Aerosol Furniture Polish
(Carbon Dioxide Propellant)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Isopar E	22.5
Hoechst Wax A3 CS	0.5
SF 96 (100)	2.3
Viscasil (10,000)	0.5
Span 80	0.3
Part B:	
Water	73.9

Procedure:

- 1.) Heat Part A to 85C.
- 2.) Heat Part B to 70C.
- 3.) Add Part B to Part A with high shear mixing.
- 4.) Cool to room temperature when homogeneous.

Preparation of Aerosol:

<u>Loading:</u>	<u>Part/Wt(%)</u>
Polish Concentrate	97.5
Carbon Dioxide	2.5*

*This will give a can pressure of approximately 105 psig.

Aerosol Valve:**Precision Valve Part Numbers:**

- Button: Part No. 01-5843 (0.020" MBFT RS)
- Stem: Part No. 04-1215 (0.016")
- Gasket: Part No. 05-0310 (BUNA)
- Body: Part No. 07-1901 (0.080")

- 5.) Package in suitable containers.

General Purpose Liquid Polish
(Oil-In-Water Type)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	2.50
Viscasil (10,000)	1.00
Hoechst Wax E	1.50
Oleic Acid	1.50
Isopar M	10.00
Part B:	
Water	70.05
Carbopol 934	0.25
Morpholine	1.60
Kathon CG	0.10
Part C:	
Isopar M	2.00
SF 1706	1.50
Part D:	
Kaopolite SF	8.00

Procedure:

- 1.) Heat Part A to 95C. (2.) Heat Part B to 85C. (3.) Add Part A to Part B with high shear mixing. (4.) When homogeneous, cool to 60C and add Part C with high shear mixing. (5.) Add Part D with moderate mixing. (6.) Cool and package in suitable containers.

SOURCE: GE Silicones: Formula FP 3003/Formula AP 1000

Aerosol Furniture Polish
(Hydrocarbon Propellant)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Isopar E	14.75
Hoechst Wax A3 CS	0.50
SF 96 (100)	2.30
Viscasil (10,000)	0.50
Span 80	0.25
Tween 81	0.08
Part B:	
Water	81.62

Procedure:

- 1.) Heat Part A to 85C.
- 2.) Heat Part B to 70C.
- 3.) Add Part B to Part A with high shear mixing.
- 4.) Cool to room temperature when homogeneous.

Preparation of Aerosol:

<u>Loading:</u>	<u>Part/Wt(%)</u>
Polish Concentrate	90.0
A 46 Propellant	10.0

Aerosol Valve:**Precision Valve Part Numbers:**

- Button: Part No. 01-5843 (0.020" MBFT RS)
- Stem: Part No. 04-1240 (0.024")
- Gasket: Part No. 05-0310 (BUNA)
- Body: Part No. 07-1901 (0.080")

5. Package in suitable containers.

Furniture Paste Wax

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Viscasil (30,000)	7.0
Hoechst Wax E	7.0
Hoechst Wax F	3.0
Ross Micro Wax 1135/15W	6.0
Ross Ozokerite Wax 77Y	1.0
Part B:	
Isopar L	76.0

Procedure:

- 1.) Heat Part A to 100C.
- 2.) Heat Part B to 95C.
- 3.) Add Part B to Part A with gentle mixing.
- 4.) Cool to 50-52C with gentle mixing and pour into containers. Allow containers to cool before capping. A flow of air across surface of container will improve cooling process. Multiple pour cycles can be used for deep containers.

Alternate Method:

- 1.) Heat Part A to 100C.
- 2.) Add Part B (unheated) slowly while blending.
- 3.) Reheat Part AB until a clear solution is obtained. Follow above procedure from here.

SOURCE: GE Silicones: Formula FP 3002/Formula FP 3004

Detergent Resistant, Cream Cleaner Polish

Ingredients:	% by Weight
(1) Deodorized Kerosene	10.0
(2) Hoechst Wax S	8.0
(3) GP-7104 (Silicone Fluid)	3.0
(4) GP-10-1,000 cstk (Dimethyl Silicone Fluid)	4.0
(5) Oleic Acid	1.0
(6) Soft Water	2.4
(7) Morpholine	0.8
(8) Soft Water	38.8
(9) Mineral Spirits (Low Odor)	20.0
(10) Kaopolite SF	12.0

Procedure:

Combine (1) through (5) and heat to 212F with low to moderate mixing. Remove heat, increase mixing and add (6) through (10) as instructed below.

Heat (6) to 210F, stir in (7), then pour into the batch. Heat (8) to 210F and add to the batch. Add (9) then (10) slowly to the batch, allowing complete mixing of each.

Mix slowly until temperature of batch reaches 110F. Package.

Formula 4-2

Non-Abrasive, Detergent Resistant, Glaze Emulsion

Ingredients:	% by Weight
(A) (1) GP-10-1,000 cstk (Dimethyl Silicone Fluid)	3.0
(2) GP-7104 (Silicone Fluid)	3.0
(3) Hoechst Wax S	1.5
(4) Carnauba Wax #3	1.0
(5) Oleic Acid	1.5
(6) Mineral Spirits	4.6
(B) (7) Soft Water	83.6
(8) Carbopol 934	0.2
(9) Triethanolamine 99%	0.2
(10) Morpholine	1.4

Procedure:

(A) Combine (1) through (6) and heat to 150F with mixing.

(B) Heat (7) to 100F. With high shear mixing add (8) to (7). Once (8) is dissolved add (9) and then add (10).

Add (A) to (B) slowly, with high shear mixing. Continue mixing until emulsion reaches 70F. Package.

Formula 8-1

SOURCE: Genesee Polymers Corp.: Suggested Formulations

High Gloss, Detergent Resistant, Soft Paste Polish

<u>Ingredients:</u>		<u>% by Weight</u>
(A)	(1) Hoechst Wax OP	7.0
	(2) Hoechst Wax E	8.0
	(3) Ozokerite	1.5
(B)	(4) GP-7104 (Silicone Fluid)	3.0
	(5) GP-10-1,000 cstk (Dimethyl Silicone Fluid)	3.0
	(6) GP-10-12,500 cstk (Dimethyl Silicone Fluid)	2.0
	(7) Mineral Spirits (Low Odor)	36.0
	(8) Deodorized Kerosene	9.5
	(9) Kaopolite SF	12.0
	(10) Mineral Spirits (Low Odor)	18.0

Procedure:

- (A) Combine (1), (2), and (3), heat to 230F to melt waxes.
 (B) Separately mix and heat (4), (5), (6), (7), and (8) to 160F. Slowly add (B) to (A) with mixing. Temperature of batch after adding (B) to (A) should be 195F. Add (9) then (10) to batch with mixing. Remove heat and mix well until temperature reaches 140F. Package.

Formula 5-2

Detergent Resistant Cream Polish

<u>Ingredients:</u>		<u>% by Weight</u>
(1)	Witconol 14	1.5
(2)	GP-10-1,000 cstk (Dimethyl Silicone Fluid)	3.0
(3)	Carnauba Wax #3	10.0
(4)	Isopar L	25.0
(5)	Morpholine	0.4
(6)	GP-7104 (Silicone Fluid)	3.1
(7)	Soft Water	47.1
(8)	Kaopolite SF	10.0

Procedure:

Combine (1), (2), (3), and 50% of (4) in a container and heat to 195F with mixing to melt wax. Once wax is melted, add (5) with mixing. Add (6) to mixture followed by the rest of (4), keeping the temperature at 175F. Remove from heat and mix until temperature reaches 130F. Package.

Formula 3-2

SOURCE: Genesee Polymers Corp.: Suggested Formulations

Liquid Polish For Clear Coat Finishes

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	3.50
Hoechst Wax S	1.00
Hoechst Wax E	1.60
Oleic Acid	1.50
Isopar M	5.00
Part B:	
Water	77.75
Carbopol 934	0.20
Morpholine	1.60
Kathon CG	0.10
Part C:	
Isopar M	1.00
SF 1706	0.75
Part D:	
Kaopolite 1152	6.00

Procedure:

- 1.) Heat Part A to 95C.
- 2.) Heat Part B to 85C.
- 3.) Add Part A to Part B with high shear mixing.
- 4.) When homogeneous, cool to 60C and add Part C with high shear mixing.
- 5.) Add Part D with moderate mixing.
- 6.) Cool and package in suitable containers.

Liquid Polish-No Solvent

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	5.00
Hoechst Wax E	1.50
Oleic Acid	1.50
Part B:	
Carbopol 934	0.25
Morpholine	1.50
Water	74.15
Kathon CG	0.10
Part C:	
SF 96 (100)	2.00
SF 1706	2.00
Part D:	
Kaopolite 1152	7.80
Snow Floss	4.20

Procedure:

- 1.) Heat Part A to 95-100C.
- 2.) Heat Part B to 85C.
- 3.) Add Part A to Part B with high shear mixing.
- 4.) When homogeneous, cool to 60-70C and add Part C with continued high shear mixing.
- 5.) When homogeneous, reduce mixing to medium speed and slowly blend in Part D.
- 6.) Cool and package in suitable containers.

SOURCE: GE Silicones: Formula AP1001/Formula AP1002

Liquid Polish (Outer Phase Oil)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Viscasil (10,000)	1.50
Witcamide 511	1.00
Tween 81	0.15
Hoechst Wax OP	1.30
Ross Ozokerite 77Y	0.20
Isopar M	20.00
Part B:	
Water	55.85
Kaopolite 1152	4.50
Kaopolite SF	4.50
Part C:	
Isopar L	6.00
SF 1705	3.00
SF 1706	2.00
Procedure:	
1.) Heat Part A to 90-95C.	
2.) Heat Part B to 80C.	
3.) Add Part B to Part A with high shear mixing.	
4.) When homogeneous, cool to 50-60C and add Part C with continued high shear mixing.	
5.) Cool and package in suitable containers.	
Formula AP 1003	

Non-Wax Liquid Polish (Oil-In-Water Type)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	4.00
Viscasil (10,000)	1.00
Isopar L	11.00
Oleic Acid	1.50
Part B:	
Water	65.95
Carbopol 934	0.25
Morpholine	1.70
Kathon CG	0.10
Part C:	
Isopar M	4.00
SF 1706	1.50
Part D:	
Kaopolite 1152	6.00
Snow Floss	3.00
Procedure:	
1.) Add Part A to Part B with high shear mixing.	
2.) When AB is homogeneous, add Part C, also with high shear mixing.	
3.) Add Part D with moderate mixing until homogeneous.	
4.) Package in suitable containers.	
Formula AP 1004	
SOURCE: GE Silicones: Suggested Formulations	

Liquid Furniture Polish

<u>Materials:</u>	<u>Part/Wt(%)</u>
SM 2133	4.0
SM 2135	2.0
20% Wax Emulsion	2.5
Carbopol 934	0.2
Triethanolamine	0.2
Water	91.1
Biocide	q.s.

20% Wax Emulsion-1

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Cardis 36 Wax	10.0
Hoechst Wax A3 CS	10.0
Oleic Acid	3.0
Morpholine	4.0
Part B:	
Water	73.0
Biocide	q.s.

20% Wax Emulsion-2

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Cardis 36 Wax	10.0
Hoechst Wax A3 CS	10.0
Oleic Acid	3.0
Diethylaminoethanol (DEAE)	2.5
Part B:	
Water	74.5
Biocide	q.s.

Preparation of Wax Emulsion:

- 1.) Add Cardis 36 wax, Hoechst wax A3 CS, and oleic acid to a vessel, and with mild stirring bring the temperature up to 96-100C.
- 2.) When completely melted, add either the morpholine or DEAE until mixture is homogeneous.
- 3.) Add Part B, preheated to 95C, slowly stirring the wax/soap mixture, maintaining temperature between 93 to 98C during this addition.
- 4.) Continue stirring until temperature reaches 45C.
- 5.) Cool to room temperature.

Preparation of Polish:

- 1.) Add water, biocide, and Carbopol 934 to a vessel, and dissolve the Carbopol with good mixing. Warm water will improve this process.
- 2.) Add triethanolamine and mix until homogeneous.
- 3.) Add other ingredients.
- 4.) Combine with mild mixing, and when homogeneous, package in suitable containers.

SOURCE: GE Silicones: Formula FP 3000

Liquid Water-Based Glaze

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	3.50
Oleic Acid	1.50
Hoechst Wax OP	1.00
Cardis 36 Wax	1.50
Isopar M	6.00
Part B:	
Water	82.55
Carbopol 934	0.25
Morpholine	1.60
Kathon CG	0.10
Part C:	
Isopar M	1.50
SF 1706	0.50

Procedure:

- 1.) Heat Part A to 95-100C.
- 2.) Heat Part B to 90-95C.
- 3.) Add Part A to Part B with high shear mixing.
- 4.) Cool to 60-70C and add Part C with high shear mixing.
- 5.) Cool with continued moderate mixing.
- 6.) Package in suitable containers.

Formula AP 1005

Solvent Wax Glaze

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (1000)	3.0
Hoechst Wax OM	0.6
Hoechst Wax F	1.4
Deodorized Kerosene	10.0
Part B:	
Odorless Mineral Spirits	84.0
SR 107	1.0

Procedure:

- 1.) Heat Part A to 95C. Be sure all wax is completely melted and dispersed.
- 2.) Add Part B with moderate mixing.
- 3.) Continue mixing and cool to room temperature.
- 4.) Package in suitable containers.

Formula AP 1008

SOURCE: GE Silicones: Suggested Formulations

Paste Polish (Oil-In-Water Type)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Hoechst Wax S	5.0
Hoechst Wax OP	1.0
SF 96 (350)	4.5
Viscasil (10,000)	2.0
Stearic Acid	1.0
Isopar M	8.0
Isopar L	18.0
Part B:	
Water	42.8
Morpholine	0.7
Kaopolite 1168	8.0
Super Floss	2.0
Part C:	
Isopar M	5.0
SF 1706	2.0

Procedure:

- 1.) Heat Part A to 90-95C.
- 2.) Heat Part B to 80-85C.
- 3.) Add Part A to Part B with good mixing.
- 4.) When homogeneous, cool to 60C and add Part C with continued mixing.
- 5.) Cool to suitable pour temperature (<50C).
- 6.) Package in suitable containers.

Comments:

The pour temperature will depend on equipment and rate and degree of cooling available on the filling line. With slow cooling rate, the cooling cycle must be done without covers to prevent condensation inside containers.

Spray-And-Wipe Polish

<u>Materials:</u>	<u>Part/Wt(%)</u>
SM 2109	8.00
AF 9020	0.05
Veegum Pro	0.80
Proxcel GXL	0.15
Kaopolite SF	5.00
Water	86.00

Procedure:

- 1.) Add water, Proxcel GXL, and Veegum Pro to a mixing vessel, and, using high shear, disperse until uniform.
- 2.) Add Kaopolite SF and continue mixing with high shear until a uniform fine dispersion is obtained.
- 3.) Reduce mixing to low to moderate and add AF 9020 and SM 2109 emulsions. Do Not Overmix. These materials easily disperse in a very short time period.
- 4.) Package in suitable sprayable containers.

SOURCE: GE Silicones: Formula BP 2001/Formula AP 1010

Paste Polish (Oil-In-Water Type)-(1)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	4.5
Viscasil (10,000)	2.0
Hoechst Wax S	5.0
Hoechst Wax OP	1.0
Stearic Acid	1.0
Isopar M	8.0
Isopar L	18.0
Part B:	
Water	42.7
Morpholine	0.7
Kaopolite SF	8.0
Snow Floss	2.0
Kathon CG	0.1
Part C:	
Isopar M	5.0
SF 1706	2.0

Paste Polish (Oil-In-Water Type)-(2)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	4.5
Viscasil (10,000)	2.0
Hoechst Wax S	5.0
Hoechst Wax OP	1.0
Stearic Acid	1.0
Isopar M	8.0
Isopar L	18.0
Part B:	
Water	41.7
Morpholine	0.7
Kaopolite 1152	7.8
Snow Floss	4.2
Kathon CG	0.1
Part C:	
Isopar M	4.0
SF 1706	2.0

Procedure:

- 1.) Heat Part A to 90-95C. (2.) Heat Part B to 80-85C.
- 3.) Add Part A to Part B with good mixing. (4.) When homogeneous, cool to 60C and add Part C with continued mixing. (5.) Cool to suitable pour temperature, e.g., >50C.
- 6.) Pour into suitable containers.

Comments:

The pour temperature will depend on equipment, rate and degree of cooling available on the filling line. With slow cooling rate, the cooling cycle must be done without covers to prevent condensation inside containers.

SOURCE: GE Silicones: Formula AP 1006

Paste Polish (Oil-In-Water Type)-(3)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	4.5
Viscasil (10,000)	2.0
Hoechst Wax S	5.0
Hoechst Wax OP	1.0
Stearic Acid	1.0
Isopar M	8.0
Isopar L	18.0
Part B:	
Water	42.7
Morpholine	0.7
Kaopolite 1152	7.5
Snow Floss	2.5
Kathon CG	0.1
Part C:	
Isopar M	5.0
SF 1706	2.0

- 1.) Heat Part A to 90-95C.
- 2.) Heat Part B to 80-85C.
- 3.) Add Part A to Part B with good mixing.
- 4.) When homogeneous, cool to 60C and add Part C with continued mixing.
- 5.) Cool to suitable pour temperature, e.g., >50C.
- 6.) Pour into suitable containers.

Comments:

The pour temperature will depend on equipment, rate and degree of cooling on the filling line. With slow cooling rate, the cooling cycle must be done without covers to prevent condensation inside containers.

Paste Polish (Outer Phase Oil)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Viscasil (10,000)	2.50
Hoechst Wax S	1.80
Hoechst Wax E	2.00
Ross Ozokerite 77Y	0.15
Span 80	2.00
Tween 81	0.15
Isopar L	17.00
Isopar M	5.00
Part B:	
Water	52.40
Kaopolite 1152	6.00
Snow Floss	3.00
Part C:	
Isopar M	2.00
SF 1705	4.00
SF 1706	2.00

1. Heat Part A to 95C. (2.) Heat Part B to 80C. (3.) Add Part B to Part A with high shear mixing. (4.) Cool to 60-65C and add Part C with good mixing. (5.) Cool to 55C and pour into suitable containers.

SOURCE: GE Silicones: Formula AP 1006(3)/AP 1007

Spray-And-Wipe Polish (Pump)

<u>Materials:</u>	<u>Part/Wt(%)</u>
SM 2133	3.0
SM 2135	2.0
20% Wax Emulsion	2.5
Water	92.5
Biocide	q.s.

20% Wax Emulsion-(1)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Cardis 36 Wax	10.0
Hoechst Wax A3 CS	10.0
Oleic Acid	3.0
Morpholine	4.0
Part B:	
Water	73.0
Biocide	q.s.

20% Wax Emulsion-(2)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
Cardis 36 Wax	10.0
Hoechst Wax A3 CS	10.0
Oleic Acid	3.0
Diethylaminoethanol (DEAE)	2.5
Part B:	
Water	74.5
Biocide	q.s.

Preparation of Wax Emulsion:

- 1.) Add Cardis 36 wax, Hoechst wax A3 CS, and oleic acid to a vessel and, with mild stirring, bring temperature up to 98-100C.
- 2.) When completely melted, add either the morpholine or DEAE until mixture is homogeneous.
- 3.) Add Part B, preheated to 95C, slowly stirring the wax/soap mixture, maintaining temperature between 93 and 98C during the addition.
- 4.) Continue stirring until temperature reaches 45C.
- 5.) Cool to room temperature.

Preparation of Polish:

Blend all ingredients together with mild stirring, and package in suitable containers.

SOURCE: GE Silicones: Formula FP 3001

Spray & Wipe Type-Aerosol or Non-Aerosol(1)

	<u>% by Weight</u>
Concord Co-Wax Emulsion, 12%	4.1
Silicone (Union Carbide LE-461)	7.0
Distilled Water	88.9

Spray & Wipe Type-Aerosol or Non-Aerosol(2)

	<u>% by Weight</u>
Concord Co-Wax Emulsion, 12%	7.5
Silicone (Union Carbide LE-461)	12.5
Silicone (Union Carbide LE-462)	2.5
Distilled Water	77.5

Spray & Wipe Type-Aerosol or Non-Aerosol(3)

	<u>% by Weight</u>
Concord Co-Wax Emulsion, 12%	7.5
Silicone (Union Carbide LE-461)	12.5
Silicone (Union Carbide LE-462)	2.5
Triethanolamine Lauryl Sulfate	1.5
Distilled Water	76.0

The formulas listed above are suggested formulas. Every effort has been made to optimize all properties to get the best polish with regard to specific amounts of ingredients. Formula #1 is the best all around polish. It features excellent gloss, application ease and economy. Formula #3 is an example of light foam-type polish, and offers better removal of soil and emulsification of propellents. Formula #2 illustrates a high gloss formula with excellent protective qualities.

Liquid Wax-Solvent Furniture or Floor Polish

	<u>% by Weight</u>
Concord Wax #1600	6.0
Silicone General Electric SF 96-100	1.0
Safety Solvent (Stoddard Solvent)	93.0

Procedure:

Melt wax and silicone together at a temperature of 195-200F. in one half of the solvent. The balance of the cold solvent is then added to this solution after the waxes are melted.

SOURCE: Concord Chemical Co., Inc.: Suggested Formulations

12. Rinse Aids

Automatic Dishwash Rinse Aid (For Hard Water)
Acid Hard Water Tolerant Formulation

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	30.00
Mazawet 36	55.00
Glycolic Acid (57%)	10.00
Isopropyl Alcohol	5.00

pH, 1%: 2.0-3.0

Appearance: Clear, slightly viscous, light-yellow liquid

Specific Gravity: 1.01

Procedure:

Charge the water and Mazawet 36 to the mixing vessel and start agitation. Charge the Glycolic Acid and Isopropyl Alcohol and mix until clear and free of "fish eyes."

Notes:

Formulated for areas with hard water.

Normal use dilution is 100 ppm in final rinse cycle. Concentrations of use solutions may be adjusted to meet local needs or variations in equipment.

Formula CR-101

Automatic Dishwash Rinse Aid
(For Neutral or Soft Water)

Standard Formulation for Neutral or Soft Water

<u>Ingredient:</u>	<u>Wt. %</u>
Mazawet 36	55.00
Deionized Water	40.00
Isopropyl Alcohol	5.00
Sodium Hydroxide	Q.S. to pH 6.0-7.0

pH, 1%: 6.0-7.0

Appearance; Clear, slightly viscous, light-yellow liquid

Specific Gravity: 1.01

Procedure:

Charge the ingredients in the sequence given above and mix until clear and free of "fish eyes."

Notes:

Formulated for areas with neutral or soft water.

Normal use dilution is 100 ppm in final rinse cycle. Concentrations of use solutions may be adjusted to meet local needs or variations in equipment.

The formulator may adjust the cloud-point of this system by using additional alcohol to increase it or Sodium Hydroxide to decrease it.

Formula CR-102

SOURCE: Mazer Chemicals: Suggested Formulations

Rinse Aid
Formula DW-0011

	<u>Wt. %</u>
Antarox BL-240	50.0
Urea	9.0
Water	41.0
Dye	-

Procedure

1. Dissolve urea in water.
2. Add Antarox BL-240 to water/urea solution. Mix thoroughly.

Physical Properties

pH (as is): 7.5
pH (1%): 8.1
Viscosity: 50 cps
Specific Gravity: 1.01

Rinse Aid
Formula DW-0012

	<u>Wt. %</u>
Antarox BL-225	70.0
Isopropanol	20.0
Water	10.0
Dye	-

Procedure

1. Dissolve Antarox BL-225 in water. Mix thoroughly.
2. Add isopropanol.

Physical Properties

pH (as is): 6.1
pH (1%): 8.3
Viscosity: 30 cps
Specific Gravity: 0.99

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

13. Rug, Floor, Carpet, Upholstery Shampoos and Cleaners

Basic Floor Cleaner, Liquid-A

	%
Marlon A 360 or A 365	7.0
Marlupal 013/99	3.0
Solvent BG*	3.0
Tetrapotassium pyrophosphate	5.0
Sodium metasilicate pentahydrate	5.0
KNA cumene sulphonate 40	10.0
Ammonia, 25%	1.0
Balance water, fragrance, preservative	to 100

Active matter: 7.0%

Basic Floor Cleaner, Liquid-B

	%
Marlupal 013/99	3.0
Marlowet 5622	4.0
Solvent BG*	20.0
Tetrapotassium pyrophosphate	3.0
Ammonia, 25%	1.0
Balance water, fragrance, preservative	to 100

Active matter: 6.7%

Floor Cleaner, for Everyday Use, Liquid-A

	%
Marlon PS 65	5.0
Lipoxol 12000*	6.0
Marlamid DF 1218	1.5
Isopropanol*	20.0
Fragrance	0.5
Balance water, dyestuff	to 100

Active matter: 4.7%

Floor Cleaner, for Everyday Use, Liquid-B

	%
Marlupal KF	3.0
Citric acid	0.2
Isopropanol*	25.0
Fragrance	0.5
Balance water, dyestuff	to 100

Active matter: 3.0%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

Carpet and Upholstery Cleaners
Dry-Foam Cleaner, Liquid-A

	%
Marlinat SRN 30	30.0
Methacrylate copolymer, e.g. Syntran 6520	20.0
Nitrilotriacetate powder	1.0
Balance water, fragrance, preservative	to 100

Active matter: 9.0%

Dry-Foam Cleaner, Liquid-B

	%
Marlinat SRN 30	40.0
Nitrilotriacetate powder	0.5
Balance water, fragrance, preservative	to 100

Active matter: 12.0%

Dry-Foam Cleaner, Powder-A

	%
Marlinat SRN 30	5.0
Methoxypropanol	5.0
Technocell 90 DU	50.0
Balance water, fragrance, preservative	to 100

Active matter: 1.5%

Dry-Foam Cleaner, Powder-B

	%
Marlinat DFK 30	5.0
Methoxypropanol	5.0
Technocell 90 DU	50.0
Balance water, fragrance, preservative	to 100

Active matter: 1.5%

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

Carpet Shampoo, High Foam

	<u>% by Weight</u>
Water	10.0
Petro BAF Liquid	15.0
Witcolate WAC-LA	75.0

Blending Procedure:

Blend ingredients in the order listed.

Petro BAF, in combination with sodium lauryl sulfate, reduces the low temperature cloud point, giving excellent freeze/thaw properties. The Petro BAF combination dries less tacky than sodium lauryl sulfate alone.

Formula 911

Carpet Shampoo, High Foam

	<u>% by Weight</u>
Water	78.3
Petro BAF Liquid	5.0
Witcolate WAC-LA	16.7

Blending Procedure:

Blend ingredients in the order listed.

Petro BAF, in combination with sodium lauryl sulfate, reduces the low temperature cloud point, giving excellent freeze/thaw properties. The Petro BAF combination dries less tacky than sodium lauryl sulfate alone.

Formula 908

SOURCE: Witco Corp.: Suggested Formulations

Evaporative (No Rinse) Wax Stripper

Formula FC-0056

	<u>Wt. %</u>
Miranol JEM Concentrate	0.5
Monoethanolamine	6.5
Butoxyethoxypropanol	2.5
Isopropanol	19.0
Water	72.5

Procedure

Add the ingredients and mix until uniform.

Physical Properties

Appearance: Clear solution

pH, as is: 11.4

Viscosity: <10 cps

Specific Gravity: 0.97

Waxed Floor Cleaner

Formula FC-0055

	<u>Wt. %</u>
Rhodafac RA-600	5.0
Alkamide DC 212/S	1.0
Tetrapotassium Pyrophosphate (60% Active)	25.0
Water	69.0

Procedure

Add ingredients one by one, in order listed above, mixing well after each addition.

Physical Properties

pH, as is: 8.6

pH (1%): 8.6

Viscosity: 10 cps

Specific Gravity: 1.04

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Floor Cleaner
Formula FC-0053

	<u>Wt. %</u>
Rhodafac LO-529	6.0
Sodium Tripolyphosphate	3.0
Tetrasodium Pyrophosphate	3.0
Water	88.0

Procedure

1. Dissolve solids in the total amount of water.
2. Add Rhodafac LO-529. Mix thoroughly.

Physical Properties

pH, as is: 13.9
pH (1%): 8.9
Viscosity: 60 cps
Specific Gravity: 1.09

Floor Cleaner
Formula FC-0054

	<u>Wt. %</u>
Rhodafac LO-529	5.0
Alkamide DC-212/S	1.0
Tetrasodium Pyrophosphate (65% Active)	2.0
Trisodium Phosphate	1.0
Diethylene Glycol Monoethyl Ether	1.0
Water	90.0
Perfume and Colorants added, as desired, replacing water	

Procedure

1. Dissolve Tetrasodium Pyrophosphate in water. Add Trisodium Phosphate. Dissolve thoroughly.
2. Add Rhodafac LO-529 and Alkamide DC-212/S.
3. Add solvent.

Physical Properties

pH, as is: 11.0
pH (1%): 9.0
Viscosity: 290 cps
Specific Gravity: 1.01

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Floor Polish
Mor-Glo 2-457 20% Solids

Use with low speed spray buffing and high speed maintenance programs using plug-in electric burnishers and synthetic pads. Produces higher initial gloss than the 442 formulation. Can be burnished daily or on an intermittent schedule without producing excessive amounts of dust. Multiple recoats of 4-5 coats per application are recommended with 30-45 min. drying time depending on solids. With these maintenance procedures a consistent high level of appearance can be sustained over an extended period of time.

<u>Item:</u>	<u>Components:</u>	<u>Weight Percent</u>
1	Water	47.87
2	Diethylene Glycol Monoethyl Ether	3.37
3	Tributoxyethyl Phosphate	2.95
4	Fluorad FC-129 (1% active solution)	0.50
5	Antifoam Emulsion*	0.02
6	Proxel GXL	0.10
7	Mor-Glo 2 Latex (38%)	39.49
8	Morton Conrez 510 (25% solution)	1.00
9	AC-325 Anionic (35%)	2.51
10	E-43 Nonionic (40%)	2.19

Procedure:

With good agitation add the components in the order listed. After the addition of item #6, allow to mix for 30 min. before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 90/0/10
 Typical pH: 8.5
 Formulation Density: 8.54 lbs./gal.
 Specific Gravity: 1.026

Typical Density Values:

<u>Solids:</u>	<u>Pounds/gal.</u>	<u>Specific Gravity</u>
25%	8.60	1.032
20%	8.54	1.026
15%	8.49	1.019

*SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International, Inc.: Formula Mor-Glo 2-457
 20% Solids

Floor Polish
ML-870-389 20% Solids

Use with low speed spray buffing and high speed maintenance programs. This product maintains a high initial gloss and can be burnished on an intermittent schedule. With these maintenance procedures, a consistent high level of appearance can be sustained over an extended period of time. Up to five coats per application may be applied with 30-45 min. drying time depending on solids and conditions.

<u>Item:</u>	<u>Components:</u>	<u>Weight Percent</u>
1	Water	42.36
2	Diethylene Glycol Monoethyl Ether	4.97
3	Tributoxyethyl Phosphate	1.24
4	Dibutyl Phthalate	0.65
5	Igepal CO 977	0.20
6	Fluorad FC-129 (1% solution)	0.60
7	Antifoam*	0.02
8	Proxel GXL	0.10
9	ML-870 Latex (38%)	34.89
10	Morton Conrez 510 (25% solution)	7.45
11	AC-325 Nonionic (35%)	4.01
12	E-43 Nonionic (40%)	3.51

Procedure:

With good agitation, add the components in the order listed. After the addition of item #8, allow to mix for 30 minutes before continuing. Add the remaining components slowly.

Formulation Constants:

Polymer/Resin/Wax Ratio: 74/10/16
 Typical pH: 8.0
 Formulation Density: 8.52 lbs./gal.
 Specific Gravity: 1.023

Typical Density Values:

<u>Solids:</u>	<u>Pounds/Gal.</u>	<u>Specific Gravity</u>
25%	8.57	1.029
20%	8.52	1.023
15%	8.47	1.017

*SAG 1010 from Union Carbide Corp., or SWS 211 from Wacker Silicones Corp.

SOURCE: Morton International: Formulation ML-870-389 20% Solids

Liquid Carpet Cleaner

	<u>% by Weight</u>
Water	72.5
SXS-40%	10.0
Sodium Bicarbonate	5.0
STPP	5.0
Burcosperse AP-Liq	5.0
Burco LAF-6	2.5

Carpet Stain Remover-Liquid

	<u>% by Weight</u>
Water	To 100
Burcoterge DG-40	40
Burcosperse AP-Liq	10
Propylene Glycol	20
Sorbitol 70%	15
Burcotase SL-80	0.5-1.0

**Carpet Cleaner/Booster-Dry
Destainer**

	<u>% by Weight</u>
Burco LAF-6	2.0-6.0
Soda Ash	40-60
FB-Sodium Percarbonate	40-60

Above also eliminates odors such as those caused by pet urine.
Oxidizes stains such as coffee, wine, juice, etc.

Generally 5 ounces of above added to 5 gallons of detergent solution is sufficient for good performance.

SOURCE: Burlington Chemical Co., Inc.: Suggested Formulations

Low Cost Extraction Carpet Cleaner

	<u>% by Weight</u>
Water, D.I.	91.0
Petro 22 Powder	5.0
EDTA Powder	4.0
Perfume	q.s.

Blending Procedure:

Blend ingredients in the order listed.

Use Dilution: 1-2 oz/gal of water

Formula 901

Medium Cost Steam Extraction Carpet Cleaner

	<u>% by Weight</u>
Water, D.I.	76.5
Petro 22 Powder	3.5
Sodium Tripolyphosphate	5.0
Sodium Silicate 42 Be' (Star)*	9.0
Trisodium Phosphate, Crystal	2.0
DeSonic 9N	4.0
Perfume	q.s.
*PQ Corp.	

Blending Procedure:

Blend ingredients in the order listed.

Use Dilution: 1-2 oz/gal. of water

Formula 902

Premium, Heavy Duty Steam Extraction Carpet Cleaner

	<u>% by Weight</u>
Sodium Tripolyphosphate, Light Density	40.0
Sodium Metasilicate, Pentahydrate	54.5
Petro 22 Powder	5.0
Optical Brightener	0.5

Blending Procedure:

Blend ingredients in the order listed.

Use Dilution: 1-2 oz/gal

Formula 906

SOURCE: Witco Corp.: Suggested Formulations

Non-Ammoniated Floor Stripper

	<u>% by Weight</u>
Water	65.44
Sodium Metasilicate, Pentahydrate	1.00
Monoethanolamine	16.25
Potassium Hydroxide, 45%	3.25
Witcamide S-771	8.00
Butyl Cellosolve	4.06
Witconate SXS Liquid	2.00

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Typical Properties:

Solids: 13.3%
pH, as is: 13.3

Formula 924

Non-Ammoniated Floor Stripper

	<u>% by Weight</u>
Monoethanolamine	40.0
Witcamide S-771	20.0
Butyl Cellosolve	40.0

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Typical Properties:

Solids: 20.0%
pH, as is: 11.4

Formula 923

SOURCE: Witco Corp.: Suggested Formulations

Quarry Tile Cleaner

<u>Ingredients:</u>	<u>% by Weight</u>
Water	88.0
Bio-Soft S-100	4.0
Makon 10	3.5
Hydroxy Acetic Acid (70%)	3.0
HCl (37%)	1.5

Mixing Procedure:

Mix thoroughly in order given.

Typical Properties:

Appearance: Light yellow, clear liquid
pH, as is: 1.87
Specific Gravity, g/ml: 1.01
Viscosity, @ 25C, cps: 15

Stability:

40F (7 days): Pass
75F (7 days): Pass
120F (7 days): Pass
Freeze/Thaw (3 cycles): Pass

Use Instructions:

One time only: Heavily soiled floor: wet floor with water and pour concentrate directly on. Spread with mop and leave for ten minutes. Scrub and squeegee, rinse with water. Dry with clean mop.

Daily Cleaning: 4 oz/1 gal water dilution. Apply with mop and leave for five minutes, then scrub, rinse, and dry.

SOURCE: Stepan Co.: Formulation No. 562

Low Foam Floor Cleaner

	<u>% by Weight</u>
Water	70
Sodium Metasilicate (Anhydrous)	5
Tetrapotassium Pyrophosphate	14
Mona NF-10	11

Procedure:

Add ingredients in the order listed with agitation.

Typical Properties:

Cloud Point: 93C
Kraft Point: <0C

Recommended Use Dilution: 1 to 4 oz./gal.

SOURCE: Mona Industries, Inc.: Formulation F-545

Special-Purpose Floor Cleaner, Liquid-A

	%
Marlon A 365	10.0
Marlophor ND-DEA-salt	5.0
Marlowet T or 5622	5.0
Na cumene sulphonate 40	10.0
Triethanolamine*	4.0
Tetrapotassium pyrophosphate	6.0
Balance water, fragrance, preservative	to 100

Active matter: 16.5%

Formulation A with antistatic properties

Special-Purpose Floor Cleaner, Liquid-B

	%
Marlon PS 65	5.0
Isopropanol*	25.0
Lonzabac 12.30	3.0
Nitrilotriacetate, 40%	0.5
Balance water, fragrance, preservative	to 100

Active matter: 3.3%

Formulation B with microbicidal properties

Wash-and-Wax Floor Cleaner, Liquid-A

	%
Marlipal 013/79	5.0
Marlox FK 64	3.0
Marlowet 5622	2.0
Nitrilotriacetate powder	0.2
Citric acid	0.3
Wax emulsion, 15%, basis Vestowax AW 1060*	10.0
Balance water, fragrance, preservative	to 100

Active matter: 9.5%

Wash-and-Wax Floor Cleaner, Liquid-B

	%
Marlipal 013/60	8.0
Marlowet 5622	2.0
Nitrilotriacetate powder	0.2
Citric acid	0.3
Wax emulsion, 15%, basis Vestowax AW 1060*	10.0
Balance water, fragrance, preservative	to 100
Active matter: 10.0%	

SOURCE: Huls America, Inc.: Basic Formulations of Detergents and Cleaning Agents for Household Purposes

14. Miscellaneous

Condensate TL: Typical Formulations**All Purpose Cleaner**

Condensate TL	5.0%
Harco 20% Soap	50.0%
STPP	1-2%
Water	To 100%

Bubble Bath

Diethanolamine Laurel Sulfate (35% Active)	
Stepanol DEA	30.0%
Condensate TL	5.0%
Water	65.0%

Dilutable Shampoo(1:8)

Diethanolamine Laurel Sulfate (35% Active)	
Stepanol DEA	60.0%
Condensate TL	35.0%
H2SO4 (conc.)	1.15%
Isopropanol	4%
(To pH 7.0-7.5)	

Viscous Floor Cleaner

Condensate TL	9.0%
TSPP	4.0%
STPP	4.0%
Harco 20% Soap	20.0%
Water	63.0%

Dishwashing Liquid

Sodium Xylene Sulfonate	4.0%
Dodecylbenzene Sulfonic Acid	12.5%
Nonionic Detergent	6.0%
Condensate TL	3.0%
50% Caustic Soda	Adjust to pH of 7.0+-0.5
SDA 3A Alcohol	2.0
Dye & Perfume	
Water	To 100%

Opacified Hand Soap

Opacifier	0.70%
Water Soluble Lanolin	1.25%
Condensate TL	12.5%
Conc. Coconut/Veg. Oil Potash Soap	20.0%
Perfume & Dye	
Water	To 100%

SOURCE: Concord Chemical Co., Inc.: Suggested Formulations

d'Limonene Waterless Hand Cleaner

	<u>% by Weight</u>
Phase I:	
Water, D.I.	81.0
Trisodium Phosphate	1.0
Sodium Citrate	2.0
Glycerine	2.0
Phase II:	
d'Limonene	7.0
DeSonic 9N	5.0
Varonic T202	2.0

Blending Procedure:

In vessel #1 combine Phase I ingredients and mix thoroughly. Heat to 140F. Combine Phase II ingredients in separate vessel and mix thoroughly. Heat to 140F. While mixing rapidly, add Phase II to Phase I. Cool quickly to stabilize emulsion.

Typical Properties:

Appearance, Room Temp.: Heavy Cream

Solids: 12.0%

pH: 10.4

Formula 1120

Waterless Hand Cleaner

	<u>% by Weight</u>
Emphos PS-220	8.7
Kerosene, deodorized	37.9
Stoddard Solvent, deodorized	15.4
Triethanolamine, 99%	2.2
Water	35.8

Blending Procedure:

Blend ingredients in the order shown, mixing thoroughly between each addition.

Formula 1119

SOURCE: Witco Corp.: Suggested Formulations

Dry Cleaning

By using Aerosol OT-100% Surfactant in dry cleaning solvent at a concentration of ca. 0.1 oz./gal. the soaps used as aids in water-soluble stain removal can be replaced in the dry cleaning industry. In contrast to many soaps, Aerosol OT does not oxidize with consequent development of undesirable odor upon aging.

Aerosol OT-100% dissolved in a suitable solvent, such as trichloroethylene, naphtha, carbon tetrachloride, or combinations of these, can be used to remove solvent-soluble stains after fabrics have become wet with water. The mixture can then be flushed out with additional water.

As a whitener for kid gloves, it is recommended that 4 oz. of Aerosol OT-100% be dissolved in a gallon of Stoddard solvent, to which may be added from 4 to 8 oz. of zinc stearate.

A water brushing for retaining pleats is made by dissolving 4 oz. of Aerosol OT-100% Surfactant in one-half gallon of Stoddard solvent, to which is added one pint of wet spotter and one-half pint of water. The pleated items should be brushed thoroughly with the mixture, then simply hung in the air to dry, to eliminate water. The item should be re-cleaned with solvent to dispose of the other agents present. It will come out without wrinkles or disturbed pleats.

Satisfactory spotting mixtures can be made as follows:

- | | |
|------------------------------|---------|
| 1. Aerosol MA-80 Surfactant* | 1 lb. |
| Toluol | 3 qt. |
| Perchloroethylene | 1 qt. |
| Water | 1/2 pt. |

* If Aerosol OT is used instead of Aerosol MA, the mixture becomes turbid when water is added.

- | | |
|-------------------------------|--------|
| 2. Aerosol OT-100% Surfactant | 1 lb. |
| Stoddard Solvent | 2 gal. |
| Water | 3 pt. |

In order to increase the wetting out (reduce the break time) of exceptionally greasy articles, the use of 0.25% to 1.0% of a 10% aqueous solution of Aerosol OT Surfactant (based upon the weight of the water) is resorted to occasionally in laundry practices. During exceptionally busy periods, the use of 10% aqueous Aerosol OT solutions will reduce the treatment time and thus increase efficiency, although it is true that alkali together with hot water over a longer treatment period will accomplish the same results. Alkali with hot water fixes egg albumin whereas Aerosol OT Surfactant does not.

SOURCE: Cytec Industries Inc.: Suggested Formulations

Dust Control**Areas of Use:**

Dust resulting from operations such as mining coal, production of talc or face powder, milling grain and sawing wood are all fire, explosion and/or health hazards. Such dusty conditions can be alleviated or controlled by water sprays containing small amounts of Aerosol GPG Surfactant.

Reasons for Using Aerosol GPG Surfactant:

Most dusts are resistant to wetting by water alone. Concentrations of only 0.01% to 0.05% of Aerosol GPG Surfactant in water provide efficient and economical wetting.

Areas to be Sprayed:

Work surfaces may be wetted with a fine spray to prevent creation of dust. Dusty materials being conveyed may also be sprayed. This practice not only minimizes the problem of airborne dust, but simultaneously reduces product loss. Spray heads may be located at as many locations as have dust problems because the equipment required is moderate in cost and there is no hazard to personnel from Aerosol GPG Surfactant.

**Concentrations of Aerosol GPG Surfactant
Required in Stock Solutions (Parts by Weight)**

<u>Ingredients:</u>		1%
Aerosol GPG Surfactant		1.43
Ethanol		none
Water	to make 100 parts	
<u>Ingredients:</u>		5%
Aerosol GPG Surfactant		7.15
Ethanol	10-20	
Water	to make 100 parts	
<u>Ingredients:</u>		10%
Aerosol GPG Surfactant		14.3
Ethanol	15-20	
Water	to make 100 parts	
<u>Ingredients:</u>		25%
Aerosol GPG Surfactant		35.7
Ethanol	10-15	
Water	to make 100 parts	
<u>Ingredients:</u>		50%
Aerosol GPG Surfactant		71.5
Ethanol	15-20	
Water	to make 100 parts	

Procedure:

The stock solution may be introduced into the main water stream by a proportioning pump or an eductor. The strength of the final solution may be adjusted by changing the amount or strength of the stock solution being added. The range of strength concentrations shown in the table above will allow any ordinary method of metering.

Further control may be provided by use of adjustable spray heads.

SOURCE: Cytec Industries Inc.: Suggested Formulations

Hand and Body Cleanser

	<u>% by Weight</u>
Phase I:	
Water, D.I.	67.0
Witconate AOS	20.0
Varonic LI-48	3.7
Varonic LI-67	1.3
Ethylene Glycol Monostearate	1.6
Varamide ML-1	2.5
Phase II:	
Glycerine	0.2
Lanoquat 50	0.5
EDTA	0.1
Rewoteric AM B-15	3.1
Phase III:	
Citric Acid	q.s.
Phase IV:	
Sodium Chloride	q.s.
Phase V:	
Preservative	q.s.

Blending Procedure:

Heat Phase I water to 80C. Blend in Witconate AOS with good agitation. When this is blended completely, add the remaining Phase I ingredients, melting them first before adding. Cool to 45C and add Phase II, in the order listed. Cool to 35C and adjust pH = 7.0-7.7 with citric acid. Add sodium chloride to desired viscosity.

Typical Properties:

Solids: 19.5%
pH: 7.3

SOURCE: Witco Corp.: Formula 1125

Heavy Duty Degreaser

	<u>Weight, %</u>
Butoxyethanol	8.0
Mackam JS	3.5
Sodium Metasilicate Pentahydrate	3.0
Sodium Tripolyphosphate	1.5
Trisodium Phosphate	2.5
Tall Oil Fatty Acid	2.0
KOH (45%)	2.1
EDTA (40%)	0.3
Deionized Water	77.3

Procedure:

1. Add components to water and heat to 40C.
2. Blend until clear.

Burnishing Compound

	<u>Weight, %</u>
Mackamide CD (Cocamide DEA)	93.0
TKPP	1.5
Glycerin	2.7
Mackadet 40K (Potassium Coconut Soap)	2.7

Procedure:

1. Disperse TKPP in Glycerin and add Mackadet 40K.
2. Then blend in Mackamide CD.

Remarks:

The final product will form an almost water clear product.
The product upon dilution with water will form a cloudy emulsion which requires shaking before use.

Corrosion Inhibiting Coating Oil-Emulsifiable

	<u>Weight, %</u>
Mackazoline O (Oleyl Hydroxyethyl Imidazoline)	16.5
Light Mineral Oil	75.0
Glacial Acetic Acid	1.5
Oleic Acid	7.0

Procedure:

1. Blend Mackazoline O and Mineral Oil.
2. Add Acetic Acid and Oleic Acid.
3. Blend until clear.

SOURCE: McIntyre Group Ltd.: Industrial Formulary

Heavy Duty Industrial Spray Metal Cleaner Concentrate

	<u>% by Weight</u>
Water	65
Potassium Hydroxide	10
Sodium Metasilicate (Anhydrous)	10
Sodium Carbonate	5
Mona NF-25	10

Procedure:

Add ingredients in the order listed with agitation.

Typical Properties:

Cloud Point: 43C

Kraft Point: <0C

Recommended Use Dilution: 6 to 8 oz./gal.

Formulation F-544

Low Foam Hypochlorite Cleaner

<u>Ingredients:</u>	<u>% by Weight</u>
Water	79.0
Sodium Hypochlorite (5.25%)	19.0
Mona NF-10	2.0

Procedure:

Blend ingredients in order listed. Adjust pH to 13-14 with 45% KOH.

Formulation F-655

SOURCE: Mona Industries, Inc.: Suggested Formulations

Metal Cleaner/Brightener

	<u>% by Weight</u>
Eastman EB solvent	4.5
Citric acid	4.0
Phosphoric acid (85%)	2.5
Nonionic surfactant*	3.0
Water	86.0

*Such as Neodol 91-8 alcohol ethoxylate (Shell Chemical Co.)
or Rhodasurf LA-9 alcohol ethoxylate (Rhône-Poulenc).

SOURCE: Eastman Chemical Co.: Eastman EB and DB Solvents for
Cleaners: Suggested Formulation

Hot Tank Stripper/Cleaner/Deruster

Component:	% by Weight
Caustic Potash Crystal	62.5
Anhydrous Sodium Metasilicate	10.0
Burco BSGH-270 or BSGH-Crystals	15.0
Burco ADS-100	5.0
Burco TME	2.5
Dodecylbenzenesulfonate Powder	5.0

Procedure:

Blend Caustic Potash and Sodium Metasilicate. Spray Burco TME onto mixture and blend until fully absorbed. Add Burco ADS-100, Gluconate or Glucoheptonate and Dodecylbenzenesulfonate. Blend until uniform.

Each component has a specific function. The Metasilicate will increase paint stripping efficiency provided sufficient alkalinity is present. The Gluconate or Glucoheptonate provide the derusting. Burco TME and Burco ADS-100 provide removal and dispersion of particulate soils while the Dodecylbenzenesulfonate adds wetting and oily soil detergency. Each component can be adjusted according to the improvement needed.

Low Foam Heavy Duty Alkaline Cleaner-A

Component:	% by Weight
Water	58
Sodium Metasilicate, Pentahydrate	5
Burcene 100	2
Burcosolv TM	10
Burco TME	20
Burcowet TM-LF	5

Procedure:

Add all components in the order listed. Stir until homogeneous between each addition.

Formulation A is low foaming at temperatures above 160F.

Low Foam Heavy Duty Alkaline Cleaner-B

Component:	% by Weight
Water	55
Sodium Metasilicate, Pentahydrate	5
Sodium Xylene Sulfonates 40%	8.5
Burcosolv TM	10
Burco TME	20
Burco LAF-125	5

Procedure:

Add all components in the order listed. Stir until homogeneous between each addition.

Formulation B is low foaming above 100F.

SOURCE: Burlington Chemical Co., Inc.: Suggested Formulations

Paint Brush Cleaners

Aerosol C-61 Surfactant is a cationic reagent that will activate strongly the volatile solvents commonly used for removing paint. Bristle brushes and rollers, glass, porcelain, metal, plastic, and clothing have been treated successfully. A 5-10% solution of Aerosol C-61 in a solvent, or mixed solvents is recommended.

Extremely rapid sedimentation of paint pigment has been obtained with the following composition:

<u>Ingredients:</u>	<u>% by Weight or Volume</u>
Aerosol C-61 Surfactant	5
Butyl Cellosolve Solvent	5
Xylene	90

Brushes and rollers may be cleaned immediately after use by being suspended in this mixture. In a few hours practically all of the paint pigment settles in a layer beneath the bristles. The solvent mixture may be reused repeatedly. When the pigment has settled the brush may be removed and hung in circulating air to dry. For best results, the brush then should be washed in soapy water and rinsed. If the brush is to be used again immediately, it may be rinsed in solvent instead of drying and waterwashing.

For renovating brushes that have been allowed to become caked with hard, dry paint, the following formulation has proved successful.

<u>Ingredients:</u>	<u>% by Weight or Volume</u>
Aerosol C-61 Surfactant	10
Xylene	45
Butanol	5
Mineral Spirits	40

The brush is soaked in the mixture for a time, then worked up and down to aid the penetration into the caked paint. The soaking and working may be repeated several times if the paint is very hard and dry. When the old paint has soaked out of the brush, the brush is rinsed in clean, warm water and finally washed in soapy water and rinsed again, then hung up to dry. After being dried the bristles have the appearance and feel of those of a new brush.

SOURCE: Cytec Industries Inc.: Suggested Formulations

Steam Cleaner

	<u>% by Weight</u>
Water	65
Potassium Hydroxide	3
Sodium Metasilicate (Anhydrous)	10
Tetrapotassium Pyrophosphate	10
Mona NF-15	12

Procedure:

Add ingredients in the order listed with agitation.

Typical Properties:

Cloud Point: 75C

Kraft Point: >0C

Recommended Use Dilution: 4 to 6 oz./gal.

Formulation F-541

Heavy Duty Industrial Spray Cleaner Concentrate

	<u>% by Weight</u>
Water	40
Sodium Hydroxide (50%)	50
Mona NF-25	10

Procedure:

Add ingredients in the order listed with agitation.

Typical Properties:

Cloud Point: 75C

Kraft Point: >5C

Recommended Use Dilution: 1 to 4 oz./gal.

Formulation F-543

High Solids Alkaline Cleaner

	<u>% by Weight</u>
Water	45.0
Potassium Hydroxide	10.0
Sodium Metasilicate (Anhydrous)	10.0
Tetrapotassium Pyrophosphate	25.0
Mona NF-25	10.0

Procedure:

Mix ingredients in the order listed with agitation.

Formulation F-555

SOURCE: Mona Industries, Inc.: Suggested Formulations

Wallpaper Removal

A stock solution of Aerosol OT-75% Surfactant, or a powder containing Aerosol OT-B Surfactant can be prepared for use as a wallpaper remover. Diluted with water by the user to a concentration of 0.025% Aerosol OT, the solution is highly effective in soaking off old wallpaper, and often renders the use of an expensive and bulky steamer unnecessary.

A typical liquid concentrate wallpaper remover can be prepared as follows.

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OT-75% Surfactant	15.0
Isopropyl Alcohol	15.0
Water	70.0

Directions:

Use one tablespoon of the above formulation per gallon of warm water. Apply to a large section of wallpaper and wait a few minutes. If necessary, apply again.

The following powdered concentrate may be prepared using Aerosol OT-B Surfactant:

<u>Ingredients:</u>	<u>% by Weight</u>
Sodium Sulfate (Powder)	90.0
Aerosol OT-B Surfactant	10.0

Directions:

Use one teaspoonful per gallon of warm water and apply as recommended above.

SOURCE: Cytec Industries, Inc.: Suggested Formulations

Section II

Transportation Cleaners and Polishes

15. Auto Cleaners and Polishes

Auto Polish/Cleanser
Oil in Water Emulsion

	<u>% by Weight</u>
Phase A:	
1 Deionized Water	40.5
2 668 Polishing Powder	15.0
3 Volclay NF-BC	1.0
Phase B:	
4 PEG-10 Carnauba	7.0
5 SF96-350	4.0
6 Montan Wax "S"	2.5
7 Oleic Acid	1.5
8 Morpholine	1.0
Phase C:	
9 Odorless Mineral Spirits	27.5

Procedure:

Combine Phase A under agitation and allow the Volclay to hydrate for 15 minutes. Bring temperature up to 75C. In a separate vessel, combine Phase B and while mixing, bring temperature up to 85C to melt the waxes. Gently heat the mineral spirits to 65C and add to Phase B. Once uniform and a 75C temperature is reached, slowly add this to Phase A, maintaining good agitation. Continue mixing until emulsion cools to 40C. Pour into appropriate containers.

The PEG-10 Carnauba in this formula helps to create a stable emulsion, while preserving the strength and integrity of a natural carnauba finish.

Detergent Resistant Auto Polish/Cleanser
Paste Wax

	<u>% by Weight</u>
1 Odorless Mineral Spirits	57.0
2 787 Polishing Alumina P-10 Feinst	12.0
3 Ozokerite 170	8.0
4 #3 Carnauba	6.0
5 Synthetic Carnauba	6.0
6 SF1706	5.0
7 Hexanediol Behenyl Beeswax	4.0
8 Viscasil 12M	2.0

Procedure:

Combine all ingredients, leaving out the alumina, and heat to 80C. Mix until homogeneous. Add the alumina while mixing, and cool to 35C.

The #1 Yellow Carnauba in this formula has been replaced by equal parts of #3 Carnauba and Synthetic Carnauba. This substitution has no effect on the finished product and will yield the same results. The only difference is a reduction in cost.

SOURCE: Koster Keunen Inc.: Suggested Formulations

Carnauba Hotwax

Carnauba spraywax with excellent performance and stability is produced using:

<u>Ingredient:</u>	<u>Weight%</u>
Mineral seal oil	9.0
Tomah Emulsifier Four	6.9
9-10 mole ethox. nonionic	0.3
Ethylene glycol monobutyl ether	1.3
Water (70-90F)	67.5
Emulsion C-340	15.0

Add ingredients sequentially and mix completely prior to each addition. The carwash will use the "hotwax" by diluting 1:10 with water and then injecting 6-8 oz. of the dilute product onto each car. The product will not separate or gell.

Pressure Spray Truckwash

	<u>Weight%</u>
Water	85.7
Sodium Metasilicate Pentahydrate	4.2
EDTA (liquid 46%)	1.8
Tomah Q-17-2	1.0
Tomah AO-14-2	1.0
Texstim 8741	2.0
45% Caustic Potash	2.6
Tomah Alkali Surfactant	1.7

Texstim 8741 is a nonionic surfactant which performs as a "self-demulsifying" detergent. This is extremely useful in truckwash applications. In most oil/water separators, the formulation "split" the oil and water into two phases without further treatment. The oil phase can then be skimmed off for recovery or disposal and not be sent to the sewage treatment plant.

SOURCE: Tomah Products, Inc.: Suggested Formulations

Detergent Resistant Auto Polish
Oil in Water Emulsion

	<u>% by Weight</u>
Phase A:	
1 Deionized Water	44.3
2 678 Polishing Powder	8.0
3 Volclay NF-BC	1.0
4 Morpholine	0.7
Phase B:	
5 Isopar L	18.0
6 Isopar M	8.0
7 PEG-10 Carnauba	6.0
8 Siliconyl Beeswax	6.0
9 SF96-350	3.0
10 Stearic Acid	1.0
Phase C:	
11 Isopar M	5.0
12 SF1706	2.0

Procedure:

Combine Phase A under agitation and bring temperature up to 85C. In a separate vessel, combine Phase B and while mixing, bring the temperature up to 90C. Once both phases are up to temperature, add Phase B to Phase A and maintain moderate agitation. Slowly cool and at 60C add Phase C.

The Siliconyl Beeswax performs while applying the polish by creating a smooth, even coating on the surface of the automobile. The PEG-10 Carnauba together with the amine functional silicone, gives the polished surface a deep gloss and an extremely durable finish.

High Luster Auto Finish
Paste Wax

	<u>% by Weight</u>
1 Odorless Mineral Spirits	49.0
2 Isopar L	14.0
3 Isopar M	10.0
4 SF96-350	8.0
5 #3 Carnauba	6.0
6 Synthetic Carnauba	6.0
7 Ozokerite 170	3.0
8 White Beeswax	2.0
9 Viscasil 12M	2.0

Procedure:

Combine all waxes and silicones. Heat to 85C. While mixing, slowly add the solvents. Continue mixing and cool to 40C.

Equal parts of #3 Carnauba and Synthetic Carnauba are used with the intentions of these being a direct substitute for #1 Yellow Carnauba. The #3 Carnauba and Synthetic Carnauba will yield the same results as #1 Yellow Carnauba, but at a significant cost savings.

SOURCE: Koster Keunen Inc.: Suggested Formulations

High Gloss, Detergent Resistant Polish

Formulation 20-6 is a wax-free polish, which provides a high-gloss, detergent resistant finish on non-porous substrates. Simple application, without hard rubbing or buffing results in both depth of gloss and detergent resistance for extended properties.

<u>Ingredients:</u>	<u>% by Weight</u>
(1) GP-121 Silicone Polish Additive	13.0
(2) GP-10-1,000 Silicone Fluid	2.0
(3) Stoddard Solvent	5.5
(4) Mineral Spirits (Odorless)	5.5
(5) Witcamide 511	1.4
(6) Kaopolite SF	5.0
(7) Soft Water	67.5
(8) Giv-Gard DXN	0.1

Combine in order shown with high shear mixing until thickening occurs. Mix until homogeneous and package.

Formulation Properties:

*Contains no wax	*Non-smearing
*High gloss	*Cost efficient
*Detergent resistant	*Cold blend(Only mixing required)
*Easily applied	*Resistant to wash-off

Formula 20-6

High Gloss Auto Polish/Finish

<u>Ingredients:</u>	<u>% by Weight</u>
(1) GP-121 (Silicone Polish Additive)	26.0
(2) Witcamide 511	1.4
(3) Kaopolite SF	5.0
(4) Soft Water	67.5
(5) Giv-Gard DXN	0.1

Combine in order shown with high shear mixing until thickening occurs. Mix until homogeneous and package.

Formulation Properties:

*Contains no wax	*High gloss
*Detergent resistant	*Easily applied
*Non-smearing	*Cost efficient
*Cold blend	Only mixing required

Formula 20-5

SOURCE: Genesee Polymers Corp.: Suggested Formulations

Spraywax Concentrate

The following formula should produce a clear, stable spraywax concentrate.

<u>Component:</u>	<u>Grams</u>
Kerr-McGee Mineral seal oil	18.0
Emulsifier 827	15.0
Ethylene glycol monobutyl ether	4.0
Water (70-90F)	63.0

Directions:

Charge the mineral seal oil, Emulsifier 827, ethylene glycol monobutyl ether and mix until clear. Add water slowly while mixing. When water has been added, mix about 5 more minutes. Add dye if desired. Addition of a fragrance may require a slight formulation change. The final product will be clear and is normally packaged in 5 gallon pails. The carwash should dilute 5 gallons of concentrate with 50 gallons of water and then inject about 6 ozs. of the dilute spraywax through a DEMA system onto each car.

Spraywax

The following typical formulation is highly effective, problem free, and stable in both concentrate and dilute form.

<u>Ingredient:</u>	<u>Weight %</u>
Kerr McGee Mineral Seal Oil	20.0
Emulsifier Four-HF	15.0
9-10 mole ethoxylated nonionic	1.0
Ethylene glycol monobutyl ether	3.0
Tap Water	61.0

Directions:

Charge the mineral seal oil, Emulsifier Four-HF, ethoxylated nonionic, ethylene glycol monobutyl ether and mix until clear. Add water slowly while mixing. When water has been added, mix about 5 more minutes. Add dye if desired. Addition of a fragrance may require a slight formulation change. The final product will be clear and is normally packaged in 5 gallon pails. The carwash should dilute 5 gallons of concentrate with 50 gallons of water and then inject about 6 ozs. of the dilute spraywax through a DEMA system onto each car.

SOURCE: Tomah Products, Inc.: Suggested Formulations

Spraywax Ladder of Formulas

Because mineral seal oils differ in emulsification characteristics, it is necessary to modify the formulation to achieve optimum performance. The best formula can be determined by running a ladder of formulas. Typical examples are:

<u>Component:</u>	<u>Grams-B</u>
Mineral seal oil	40.0
Emulsifier Four-HF	31.0
9-10 mole ethoxylated nonionic	1.0
Ethylene glycol monobutyl ether	6.0
Water	122.0

<u>Component:</u>	<u>Grams-C</u>
Mineral seal oil	40.0
Emulsifier Four-HF	30.5
9-10 mole ethoxylated nonionic	1.5
Ethylene glycol monobutyl ether	6.0
Water	122.0

<u>Component:</u>	<u>Grams-D</u>
Mineral seal oil	40.0
Emulsifier Four-HF	30.0
9-10 mole ethoxylated nonionic	2.0
Ethylene glycol monobutyl ether	6.0
Water	122.0

<u>Components:</u>	<u>Grams-E</u>
Mineral seal oil	40.0
Emulsifier Four-HF	29.5
9-10 mole ethoxylated nonionic	2.5
Ethylene glycol monobutyl ether	6.0
Water	122.0

Check all formulas for:

1. 1:10 dilution in water.
2. 120F stability (3 hours in sealed container in water bath at 120F).
3. Freeze/thaw-24 hour recovery (sealed container).

The optimum formula will:

1. Dilute clear and easily at 1:10 dilution.
2. Not cloud at 120F.
3. Recover completely from freeze/thaw cycle (without shaking).

SOURCE: Tomah Products, Inc.: Emulsifier Four-HF: Formulas

16. Car and Truck Wash Compounds

Automatic Car Wash Concentrate
A High Alkaline Dilutable Concentrate

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	50.00
Maphos 60-A	6.00
Potassium Hydroxide	3.00
Tetrapotassium Pyrophosphate	2.00
Sodium Metasilicate, Anhydrous	2.00
Macol LF-120	2.00
Mazamide 80	2.00
Sodium Xylene Sulfonate (40%)	3.00
Macol 48	3.00
Deionized Water	27.00
pH (as is): 12.5-13.5	
Appearance: Clear, light-yellow liquid	
Specific Gravity: 1.06	

Procedure:

Charge the first water portion to the mixing vessel and start agitation. Add the ingredients in the given sequence and mix until clear.

Notes:

This is a highly alkaline cleaner designed to be used in commercial automatic car washes at a dilution rate of 1-2 ounces per gallon. Do not use directly on automotive finishes. Formula CA-102

General Purpose Car Wash
High Foaming All-Purpose Dilutable Concentrate

<u>Ingredient:</u>	<u>Wt. %</u>
Deionized Water	50.00
Mazon 98	9.50
Macol TD-3	1.50
SLS (Sodium Lauryl Sulfate)	2.50
Mazamide 80	3.00
Macol 48	1.00
Triethanolamine (85%)	1.50
Deionized Water	31.00
pH (as is): 8.5-9.5	
Appearance: Clear, light-yellow liquid	
Specific Gravity: 1.02	

Procedure:

Charge the first portion of water to the mixing vessel and start slow agitation. Excessive agitation will produce a foaming problem. Add the remaining ingredients in the given sequence and mix until clear.

Notes:

This is a copious-foaming, all-purpose car wash formulated to be safe on car finishes, yet effective in the removal of road grime and other soils.

Use concentration is 1-2 ounces per gallon of warm water. Formula CA-103

SOURCE: Mazer Chemicals: Suggested Formulations

Auto Shampoo Concentrate

	<u>% by Weight</u>
Water, D.I.	80.0
Rewoteric AM KSF-40	15.0
Witcolate SE-5	5.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 4.0

Solids: 9.0%

pH: 9.5

Formula 628

High Foaming Car Wash

	<u>% by Weight</u>
Water, D.I.	65.0
Diethanolamine	5.0
Witco 1298SA	15.0
Varox 1770	10.0
Butyl Cellosolve	1.0
Sodium Metasilicate	1.0
Sodium Tripolyphosphate	3.0

Blending Procedure:

Add DEA to water and mix thoroughly. Slowly dissolve Witco 1298 into solution. Next, add remaining ingredients allowing to dissolve completely between additions.

Typical Properties:

Viscosity, cps: 77.0

Solids: 27.5%

pH: 9.3

Formula 631

Car Wash

	<u>% by Weight</u>
Water	34.9
Witcolate A	25.0
Witcolate S-1285C	25.0
Emcol NA-30	15.0
Preservative	0.1

Blending Procedure:

Blend ingredients in the order listed.

Typical Properties:

Solids: 28.4%

pH: 6.9

Viscosity, cps: Gel

Formula 623

SOURCE: Witco Corp.: Suggested Formulations

Car Wash Liquid
Formula TR-0023

	<u>Wt. %</u>
Alkylbenzene sulfonic acid	6.0
Sodium xylene sulfonate	11.5
Igepal CO-710	3.0
Tetrapotassium pyrophosphate (60% active)	25.0
Potassium hydroxide (45% active)	2.5
Water	52.0

Procedure

1. Dissolve alkylbenzene sulfonic acid in water.
2. Add sodium xylene sulfonate, Igepal CO-710, tetrapotassium pyrophosphate and potassium hydroxide, mixing well after each addition.
3. Filter product.

Physical Properties

pH (as is): 9.5
 pH (1%): 9.9
 Viscosity: 10 cps
 Specific Gravity: 1.05

Car Wash Powder
Formula TR-0022

	<u>Wt. %</u>
Igepal CO-710	10.0
Sodium tripolyphosphate	50.0
Sodium metasilicate pentahydrate	5.0
Sodium carbonate (Lt. density)	35.0

Procedure:

1. Mix Igepal CO-710 with sodium tripolyphosphate.
2. Add sodium metasilicate pentahydrate and sodium carbonate.

Physical Properties:

Appearance: White, free-flowing powder
 pH (1%): 11.2
 Specific Gravity: 0.73

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Economy Truck Wash
High-Pressure Spray
 (Formula TR-0024)

	<u>Wt. %</u>
Igepal CO-660	3.0
Cheelox BF-13	1.0
Sodium Xylene Sulfonate	1.5
Water	84.5

Procedure

1. Dissolve sodium xylene sulfonate in water.
2. Add Igepal CO-660. Mix thoroughly. Add Cheelox BF 13.

Physical Properties

pH (as is): 10.3
 pH (1%): 10.1
 Viscosity: 10 cps
 Specific Gravity: 1.02

Truck Wash Liquid
 Formula TR-0025

	<u>Wt. %</u>
Igepal CO-630	3.0
Rhodapex CO-436	3.5
Alkamide DC-212/S	2.0
Cheelox BF-13	3.5
Ethylene Glycol Monobutyl Ether	3.0
Water	85.0

Procedure

1. Dissolve surfactants Igepal CO-630, Rhodapex CO-436 and Alkamide DC-212/S in water.
2. Add Cheelox BF-13. Mix well.
3. Add ethylene glycol monobutyl ether.

Physical Properties

pH (as is): 9.9
 pH (1%): 9.6
 Viscosity: 10 cps
 Specific Gravity: 1.01

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Foamy Brush Car Wash, Liquid

	<u>% by Weight</u>
Water, D.I.*	79.75
Caustic Soda, 50%	1.40
Witco 1298SA	5.00
Witcolate SE-5	7.00
Petro BAF Liquid	3.00
Witcamide 128T	3.00
Formalin	0.10
Sodium Chloride	0.75

Blending Procedure:

Blend ingredients in the order listed. Sodium Chloride is used to adjust viscosity of the product.

Typical Properties:

Specific Gravity: 1.015

Wt./Gal. lbs.: 8.46

pH, as is: 9.8

Viscosity, cps: 410

Dilution Ratio at Wand = 1:40

*If unsoftened tap water is used, add 0.25% liquid EDTA, 40% to counteract hardness.

Formula 621

1:2 Dilutable Car Wash

	<u>% by Weight</u>
Water	33.71
Sodium Hydroxide, 50%	5.96
Witconate SXS (40%)	14.90
Witco 1298S	25.88
Witcamide 128T	16.76
Witcamide CDA	2.79

Blending Procedure:

Blend ingredients in the order listed.

Typical Properties:

Solids: 54.0%

pH, as is: 8.5

Viscosity, as is, cps: 580

Viscosity, 1:2, cps: 440

Formula 622

SOURCE: Witco Corp.: Suggested Formulations

High Oil Splitting Vehicle Wash-A

<u>Components:</u>	<u>% by Weight</u>
Water	71.5
Sodium Metasilicate Pentahydrate	10.0
TKPP	2.5
Sodium Xylene Sulfonates 40%	6.0
Burco TME	10.0

Add in the order listed. Blend until dissolved between each addition.

High Oil Splitting Vehicle Wash-B

<u>Components:</u>	<u>% by Weight</u>
Water	73.5
Sodium Metasilicate Pentahydrate	10.0
Burcosol ADS-40	5.0
Glycol Ether	5.0
Burco TME	10.0
Burcotrope 1250	As Required

Add in the order listed. Blend until dissolved between each addition.

SOURCE: Burlington Chemical Co., Inc.: Suggested Formulations

Liquid Car Wash
Formula TR-0020

	Formula A	Formula B
	Wt. %	Wt. %
Rhodapon SB	18.0	18.0
Alcodet SK	8.0	----
Rhodasurf 25-9	---	8.0
Tetrapotassium pyrophosphate	3.0	3.0
Sodium metasilicate	2.0	2.0
Water	69.0	69.0
Perfume	Q.S.	Q.S.
Dye	Q.S.	Q.S.

Procedure

Dissolve tetrapotassium pyrophosphate and sodium metasilicate in water. Add Rhodapon SB. Agitate until clear. Add Alcodet SK and Rhodasurf 25-9 and mix until uniform and clear. Add perfume and dye, as desired.

Physical Properties

Appearance: Clear liquid, dyed to preference
pH: 12.0
Specific Gravity: 1.03
Viscosity: <50 cps

Spray-On Car Wash Concentrate
"Grease and Grime" Remover
Formula TR-0021

	Wt. %
Rhodacal A-246/L	5.0
Rhodacal 330	20.0
Rhodapon BOS	3.3
Alcodet SK	5.0
Water	66.7

Procedure:

1. Charge water to a vessel equipped with agitation.
2. Add Rhodacal A-246/L and Rhodapon BOS to (1) above. Mix until uniform (5-10 minutes).
3. Add Rhodacal 330 and Alcodet SK to (2) above. Mix until uniform (15-30 minutes).

Physical Properties

Appearance: Viscous, gel-like liquid
pH, as is: 9.0
Specific Gravity: 1.02-1.04
Viscosity: <50 cps

SOURCE: Rhone-Poulenc Specialties & Surfactants: Formulas

Liquid High Pressure Concentrate

	<u>% by Weight</u>
Water, D.I.	46.0
Dowanol EB	2.0
Witconate SXS Liquid	1.0
Sodium Benzoate	1.0
Sodium Metasilicate	10.0
Tetrapotassium Pyrophosphate	20.0
Varion AM-KSF-40%	20.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 15
Solids: 39.4%
pH: 13.4

Formula 605

Truck Wash w/Varamide A-83

	<u>% by Weight</u>
Water, D.I.	81.0
Sodium Tripolyphosphate	3.0
Trisodium Phosphate	3.0
Sodium Metasilicate	1.0
Varamide A-83	9.0
Butyl Cellosolve	3.0

Blending Procedure:

Add ingredients in order shown and dissolve completely between each addition.

Typical Properties:

Viscosity, cps: 12
Solids: 16.0%
pH: 11.0

Formula 608

SOURCE: Witco Corp.: Suggested Formulations

Liquid Truck Wash
Formula TR-0029

	<u>Wt. %</u>
Water	73.6
Miranol FBS	6.0
Igepal CA-630	3.0
Dowanol EB (Dow Chemical)	2.0
Potassium Hydroxide (45%)	4.0
Tall Oil	3.4
Tetrapotassium Pyrophosphate	4.0
Sodium Metasilicate, Pentahydrate	4.0

Procedure

Premix the tall oil and Dowanol EB. Add the water to the mixer. Add the sodium metasilicate, the potassium hydroxide and the TKPP. Add the Miranol FBS and Igepal CA-630. Add the tall oil/Dowanol EB premix. Mix until uniform.

Physical Properties

Appearance: Clear, amber liquid
pH, as is: 12.7
Specific Gravity: 1.08
Viscosity: <50 cps

Liquid Truck Wash
Formula TR-0030

	<u>Wt. %</u>
Water	63.0
Miranol FBS	4.0
Rhodafac RA-600	2.0
Igepal CA-720	2.0
Cheelox BF-13	17.5
Tetrapotassium Pyrophosphate	1.0
Potassium Hydroxide (45%)	6.0
Sodium Metasilicate Pentahydrate	2.0
Arcosolv PTB	2.5

Procedure

Add the ingredients in the order listed and mix until uniform.

Physical Properties

Appearance: Clear, yellow liquid
pH, as is: 12.9
Specific Gravity: 1.10
Viscosity: <50 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Mild Car Shampoo

A mild rich foaming car shampoo with excellent detergency and sheeting action.

<u>Ingredients:</u>	<u>% Composition W/W</u>
Sandobet SC	4.5
DDBSA, 60%	10.8
Sandoxylate SX-424	3.6
Triethanolamine	0.8
Dye, Fragrance, Preservative, Water	Q.S.

Procedure:

Charge water to mixing vessel with moderate agitation. Hold out small portion of the water to dissolve dye. Charge the remaining components in sequence, mixing after each addition. Dissolve the dye with agitation in the water previously held out and add to the product.

Properties:

Appearance: Clear liquid

pH: 7.0-8.0

Application: Use 1 to 2 oz per 5 gallon bucket

SOURCE: Sandoz Chemicals Corp.: Formulation HHA-01

Carspray CW Concentrate

	<u>% by Weight</u>
Water, D.I.	80.0
Carspray CW	20.0

Blending Procedure:

Add Carspray to water while mixing. Continue mixing until solution is homogeneous.

Typical Properties:

Solids: 11.6%

Formula 632

Automotive "Wash & Wax"

	<u>% by Weight</u>
Witcamine AL42-12	6.9
Isopropanol	1.0
Glacial Acetic Acid	2.1
Water	65.0
Witcamide 5195	25.0

Blending Procedure:

Mix all ingredients except Witcamide 5195 in the order listed. Heat the mixture to 70C and then add Witcamide 5195. Continue mixing until solution is clear.

This formulation leaves a water "beading" film on the automobile finish,

Formula 636

SOURCE: Witco Corp.: Suggested Formulations

Premium Carspray 500 Concentrate

	<u>% by Weight</u>
Carspray 500	20.0
Butyl Cellosolve	5.0
Mineral Seal Oil*	25.0
Water, D.I.	50.0

*Kermac 600 Solvent: Kerr McGee Oil Co.

Diala A Oil: Shell Chemical

Isopar V: Exxon Chemical

Blending Procedure:

Combine Carspray, Butyl Cellosolve and Oil in vessel and mix thoroughly. In a separate vessel weigh in the water. While mixing the water, pour in the blend. Mix until solution is homogeneous.

Use Dilution:

5 gallons Concentrate to 50 gallons water.

Comments:

Carspray 500: Beading Agent with silicone.

Formula 687

Standard Carspray 500 Concentrate

	<u>% by Weight</u>
Carspray 500	16.0
Butyl Cellosolve	3.0
Mineral Seal Oil*	20.0
Water, D.I.	61.0

*Kermac 600 Solvent: Kerr McGee Oil Co.

Diala A Oil: Shell Chemical

Isopar V: Exxon Chemical

Blending Procedure:

Combine Carspray, Butyl Cellosolve and Oil in vessel and mix thoroughly. In a separate vessel weigh in the water. While mixing the water, pour in the blend. Mix until solution is homogeneous.

Use Dilution:

5 gallons Concentrate to 50 gallons water.

Comments:

Carspray 500: Beading Agent in silicone

Formula 688

SOURCE: Witco Corp.: Suggested Formulations

Premium Carspray 700 Concentrate

	<u>% by Weight</u>
Carspray 700	25.0
Mineral Seal Oil*	25.0
Water, D.I.	50.0

*Kermac 600 Solvent: Kerr McGee Oil Co.
Diala A Oil: Shell Chemical
Isopar V: Exxon Chemical

Blending Procedure:

In vessel #1, combine Carspray 700 and Mineral Seal Oil and heat to 110F with thorough mixing. In vessel #2, weigh in the water and mix until a vortex is formed. While mixing the water, pour the blend into the vortex. Mix until solution is homogeneous.

Use Dilution:

5 gallons Concentrate to 50 gallons water.

Comments:

Carspray 700: Foaming beading agent

Formula 685

Standard Carspray 700 Concentrate

	<u>% by Weight</u>
Carspray 700	16.0
Mineral Seal Oil*	16.0
Water, D.I.	68.0

*Kermac 600 Solvent: Kerr McGee Oil Co.
Diala A Oil: Shell Chemical
Isopar V: Exxon Chemical

Blending Procedure:

In vessel #1, combine Carspray 700 and Mineral Seal Oil and heat to 110F with thorough mixing. In vessel #2, weigh in the water and mix until a vortex is formed. While mixing the water, pour the blend into the vortex. Mix until solution is homogeneous.

Use Dilution:

5 gallons Concentrate to 50 gallons water.

Comments:

Carspray 700: Foaming beading agent

Formula 686

SOURCE: Witco Corp.: Suggested Formulations

17. Whitewall Tire Cleaners

White Wall Tire Cleaner

<u>Ingredients:</u>	<u>% by Wt.</u>
Sodium Metasilicate	2.00
Sodium Tripolyphosphate	2.00
Tetrapotassium Pyrophosphate	2.00
Sodium Lauryl Ether Sulfate	4.00
Solin (35%)	2.30
Sandopan B	5.00
Water (warm)	83.00

Procedure:

Charge the water to a vessel with good agitation. Charge the first three components and mix till dissolved. Charge the remaining products and mix till completely dissolved and free of gel particles.

Physical Properties:

Appearance: Clear water white to light yellow liquid

pH (as is): >9.0

Total Solids: 11.0-12.0%

Use Levels:

For final use, dilute between 4:1 and 8:1 with water.

SOURCE: Sandoz Chemicals Corp.: Formulation HHA-03

Bug Remover Concentrate

	<u>% by Weight</u>
Triethanolamine (TEA)	17.14
Butyl Cellosolve	42.86
Isopropanol	17.14
Rewoteric AM B-15	22.86

Blending Procedure:

Blend the components in the order shown. Mix until homogeneous

Dilution Rates:

1: 2 Extra Heavy Duty

1: 4 Heavy Duty

1:16 Medium Duty

1:32 Light Duty

Dilution Instructions:

Add Bug Remover Concentrate to water while mixing; continue mixing until homogeneous.

Comments:

Appearance @ 77F: Crystal clear, yellow liquid

SOURCE: Witco Corp.: Formula 677

Whitewall Tire Cleaner Concentrate

Formula TR-0031

	<u>Wt. %</u>
Water	48.0
Miranol FBS	22.0
Sodium Metasilicate, Pentahydrate	25.0
Potassium Hydroxide (45%)	3.0
Butoxyethanol	2.0

Procedure

Add ingredients in order listed. Mix until uniform.

Physical Properties

Appearance: Clear, yellow liquid
 pH, as is: 12.7
 Viscosity: <50 cps
 Specific Gravity: 1.16

Whitewall Tire Cleaner Liquid

Formula TR-0027

	<u>Wt. %</u>
Igepal CA-630	2.0
Rhodafac RA-600	6.0
M-Pyrol N-Methyl-2-Pyrrolidone (ISP)	2.0
Sodium Metasilicate, Anhydrous	3.0
Sodium Tripolyphosphate	5.0
Potassium Hydroxide	1.5
Water	80.5

Procedure

1. Dissolve sodium metasilicate, anhydrous, sodium tripolyphosphate and potassium hydroxide into water.
2. Add Igepal CA-630, Rhodafac RA-600, and M-Pyrol separately, mixing well after each addition.

Physical Properties

pH (as is): 13.3
 pH (1%): 10.7
 Viscosity: 10 cps
 Specific Gravity: 1.03

SOURCE; Rhone-Poulenc Surfactants & Specialties: Formulas

18. Miscellaneous

Automobile Windshield Cleaners

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol MA-80 Surfactant	3.5
Surfonic N-95	0.5
Isopropanol	51.0
Water	45.0

The above is diluted 5 oz. to 1 gallon of water for use. In wintertime, the recommended dilution is 10 oz. per gallon. Freezing is prevented by the isopropanol. This formulation leaves a small amount of residue on the unwiped portion of the windshield upon drying. There are several ways of preventing these visible residues.

1. Use a mixture of volatile solvents with or without surfactants. A suggested formulation is:

<u>Ingredients:</u>	<u>% by Weight</u>
2-Ethyl Hexanol	5.0
Aerosol OT-75% Surfactant	1.0
Isopropanol	47.0
Water	47.0

The above is diluted 5-10 oz. per gallon of water, and will not freeze at the higher level of concentration.

2. Using surfactants, but including small amounts of non-volatile solvents which give a transparent film on the glass with the surfactant. Non-volatile solvents having approximately the same refractive index of glass should be selected. A suggested formulation is:

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol MA-80 Surfactant	2.5
Aerosol OT-75% Surfactant	3.3
Diethylene Glycol	4.4
Isopropanol	40.0
n-Butyl-p-Hydroxy Benzoate	0.1
Methyl-p-Hydroxy Benzoate	0.1
Water	49.78

The above concentrate is used at 5 oz. per gallon (10 oz. per gallon in winter). The bactericides are present to keep the window cleaning solution free of slime and turbidity due to bacteria.

<u>Ingredients:</u>	<u>% by Weight</u>
Aerosol OT-75% Surfactant	3.5
Dibutyl phthalate	0.5-2.0
Isopropanol	48.0
Water	46-48

The above solution is diluted 5-10 oz. per gallon of water and will not freeze at the higher level of concentration.

SOURCE: Cytac Industries Inc.: Suggested Formulations

General Purpose Liquid Boat Polish-(1)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	3.50
Viscasil (10,000)	1.00
Oleic acid	1.50
Isopar M	10.00
Hoechst Wax E	1.50
Part B:	
Water	65.65
Morpholine	1.60
Carbopol 934	0.25
Part C:	
Isopar M	3.00
SF 1706	2.00
Part D:	
Snow Floss	7.50
Super Floss	2.50

General Purpose Liquid Boat Polish-(2)

<u>Materials:</u>	<u>Part/Wt(%)</u>
Part A:	
SF 96 (350)	3.50
Viscasil (10,000)	1.00
Oleic acid	1.50
Isopar M	10.00
Hoechst Wax E	1.50
Part B:	
Water	63.65
Morpholine	1.60
Carbopol 934	0.25
Part C:	
Isopar M	3.00
SF 1706	2.00
Part D:	
Kaopolite 1168	12.00

Procedure:

- 1.) Heat Part A to 90-95C. (2.) Heat Part B to 60-85C.
- 3.) Add Part A to Part B with good mixing.
- 4.) When homogeneous, cool to 60-65C and add Part C with continued high shear mixing.
- 5.) Add Part D with good mixing.
- 6.) When uniform, cool and package in suitable containers.

SOURCE: GE Silicones: Formula BP 2000

Liquid Aluminum Engine Block Cleaner
Formula TR-0032

	Wt.%
Water	82.5
Sodium Metasilicate, Anh.	4.5
Miranol FBS	5.0
Miranol JEM Conc.	2.0
Alcodet HSC-1000	4.0
D-Limonene	2.0

Procedure

Completely dissolve the sodium metasilicate in the water. Add the remaining components, with agitation, in the order listed. Premix the D-Limonene with the Alcodet HSC-1000 and add together.

Typical Properties

Appearance: Clear, yellow to amber liquid
pH, Conc.: 12.75
pH, 10%: 12.15
Specific Gravity: 1.04
Viscosity: <50 cps

Foaming Engine Cleaner
Formula TR-0019

	Wt.%
Alcodet 260	2.0
Rhodacal 330	8.0
Water	80.0
Isopar "K" (Exxon)	10.0

Procedure

1. Add Alcodet 260 and Rhodacal 330 to water at ambient temperature, stir until dissolved (10-15 minutes).
2. Add Isopar K at ambient temperature. Stir until dissolved (30 minutes).

Physical Properties

Appearance: Clear liquid
pH, as is: 7.5
Specific Gravity: 0.99
Viscosity: 10 cps

SOURCE: Rhone-Poulenc Surfactants & Specialties: Formulas

Section III

Trademarked Raw Materials

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
AC-325 Nonionic	Polymer	Allied
ACL-59	Chlorinated isocyanurate	Monsanto
Acrysol ICS-1	Water-soluble acrylic resin	Rohm&
Aerosol A-102	Mono-ester sulfosuccinate surfactant	Cytec
Aerosol A-103	Mono-ester sulfosuccinate surfactant	Cytec
Aerosol C-61	Alkylamine-guanidine ethoxylate	Cytec
Aerosol GPG	Sodium dioctyl sulfosuccinate	Cytec
Aerosol MA-80	Sodium dihexyl sulfosuccinate	Cytec
Aerosol OS	Alkyl naphthalane oxide sulfonate	Cytec
Aerosol OT	Sodium dioctyl sulfosuccinate	Cytec
Aerosol OT-B	Sodium dioctyl sulfosuccinate	Cytec
Aerosol OT-75%	Sodium dioctyl sulfosuccinate(75%)	Cytec
Aerosol OT-100%	Sodium dioctyl sulfosuccinate	Cytec
Aerosol 22	Sulfosuccinamate	Cytec
AF 9020		
Alcodet HSC-1000	Tertiary thioether surfactant	Rhone-
Alcodet SK	Cleaning surfactant	Rhone-
Alcodet 260	Cleaning surfactant	Rhone-
Alkamide DC-212	Fatty alkanolamide	ISP
Alkamide DC-212/M	Fatty alkanolamide	ISP
Alkamide DC-212/S	Fatty alkanolamide	ISP
Aluminum Oxide FPTO		
Ammonyx LO	Lauramine oxide	Stepan

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Ampholyt JB130	Coconut fatty acid amidopropyl betaine	Huls
Antarox BL-225	Aliphatic polyether nonionic	Rhone-
Antarox BL-240	Aliphatic polyether nonionic	Rhone-
Antarox BL-330	Aliphatic polyether nonionic	Rhone-
Aquamollin BC Powder		
Arcosolv PTB	Solvent	Arco
Avanel N-1525-90	Surfactant	PPG
Avanel S-70/S-74/ S-150/590	Sodium linear alkyl polyether sulfonate surfactant	PPG
BASF Surfactants	Pluronic, Plurafac, Industrol	BASF
Britesil H24	Hydrous sodium silicate	PQ
Burcene 100		Burling-
Burco ADS-40	Surfactant	Burling-
Burco ADS-100	Surfactant	Burling-
Burco BSGH-270	Surfactant	Burling-
Burco BSGH-Crystals	Surfactant	Burling-
Burco BSGH-400	Surfactant	Burling-
Burco EHS	Surfactant	Burling-
Burco FAE	Proprietary textile auxiliary	Burling-
Burco LAA-38	Surfactant	Burling-
Burco LAF-6	Surfactant	Burling-
Burco LAF-125	Proprietary textile auxiliary	Burling-
Burco NPS-225	Surfactant	Burling-

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Burco NPS 50%	Proprietary textile auxiliary	Burling-
Burcosolv TM	Water soluble solvent mixture	Burling-
Burcosperse AP	Liquid detergent polymer	Burling-
Burcosperse LP	Proprietary detergent polymer	Burling-
Burcotase SL-80	Proprietary detergent enzyme	Burling-
Burco TME	Nonionic thioether surfactant	Burling-
Burcotrope 1250		Burling-
Burcowet TM-LF	Surfactant	Burling-
Butyl Carbitol	Industrial solvent	UnCarb
Butyl Cellosolve	Industrial solvent	UnCarb
Butyl Propasol	Industrial solvent	UnCarb
Calamide C	Foam stabilizer & emulsifier	Pilot
Calamide O	Super amide	Pilot
Calfax DB-45	Disulfonate	Pilot
Calfoam EA-603	Liquid detergent	Pilot
Calfoam ES-303	Liquid detergent	Pilot
Calfoam SLS-30	Sodium lauryl sulfate 30%	Pilot
Calibrite SL		
Calimulse PRS	Emulsifier	Pilot
Caloxylate N-9		Pilot
Calsoft F-90	Sodium linear alkylbenzene sulfonate 90%	Pilot
Calsoft L-40	Linear sodium dodecylbenzene sulfonate	Pilot

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Calsoft L-60	Sodium alkylbenzene sulfonate(60%)	Pilot
Calsoft LAS-99	Dodecylbenzene sulfonic acid(60%)	Pilot
Calsuds A	Liquid detergent blend	Pilot
Calsuds CD-6	Coconut oil amide w/sulfonate	Pilot
Calsuds 81	Concentrated detergent blend	Pilot
Carbopol 934	Acrylic acid polymer.MW:3,000,000	Goodrich
Cardis 36 Wax	Oxidized microcrystalline wax	Petrol-
Carspray 500	Beading agent with silicone	Witco
Carspray 700	Foaming beading agent	Witco
Cellobond HEC 100000A		
Cheelox BF-13		
Cheelox NTA-Na3		
Clearon CDB	Sodium dichloroisocyanurate	FMC
Concord Co-Wax Emulsion, 12%		Concord
Concord Wax #1600		Concord
Condensate TL		Concord
Cyanamer A-100L	Polyacrylamide	Cytec
Dequest 2060S	Organophosphorous product	Monsanto
Dequest 2066	Organophosphorous product	Monsanto
Desonic 9N	Nonionic surfactant	DeSoto
Diala A Oil	Mineral seal oil	Shell
Dionic OC	Fatty acid methanolamide polyglycol ether	Huls

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Dowanol D	Glycol ether	Dow
Dowanol DE	Glycol ether	Dow
Dowanol DPM	Dipropylene glycol methyl ether	Dow
Dowanol EB	Ethylene glycol n-butyl ether	Dow
Dowanol PnB	Glycol ether	Dow
Dow Corning EP-1-14		DowCorn
Dowfax 2A-1	Anionic surfactant	Dow
Dowicide 32	Antimicrobial agent	Dow
Durcal 40	Calcium carbonate	
Durez Resin 15546		
E	Sodium silicate 40 Be'	PQ
E-43 Nonionic		
Emcol NA-30	Surface active agent	Witco
Emcol 4500	Surface active agent	Witco
Emersol 213	Fatty acid	Henkel
Emphos PS-220		Witco
Emulsifier Four-HF	Dialkyl quaternary	Tomah
Emulsifier 827		Tomah
Emulsion C-340		Tomah
Fluorad FC-129	Fluorochemical surfactant	3M

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Gantrez AN-149	Vinyl ether polymer	ISP
Genagen LAB		Hoechst
Genamin S-250		Hoechst
Genaminox MY		Hoechst
Genapol OA-80		Hoechst
Genapol UD-030		Hoechst
Genapol UD-050		Hoechst
Genapol UD-080		Hoechst
Genapol ZRO Liquid		Hoechst
Genapol 2908		Hoechst
General Electric SF96-100 Silicone		GESili-
Genopur ASA		Hoechst
Giv-Gard DXN		
GP-10-1,000 cstk	Dimethyl silicone fluid	Genesee
GP-10-12,500 cstk	Dimethyl silicone fluid	Genesee
GP-121	Silicone polish additive	Genesee
GP-7104	Silicone fluid	Genesee
Harco 20% Soap		
Hoe S 3924		Hoechst
Hoechst Wax A3 CS		Hoechst
Hoechst Wax E	Ester type wax. Drop point:175F	Hoechst
Hoechst Wax F		Hoechst
Hoechst Wax OM		Hoechst

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Hoechst Wax OP		Hoechst
Hoechst Wax S		Hoechst
Hostapur SAS 60		Hoechst
Hypofresh	Perfume	
Igepal CA-630	Alkyl ethoxylate nonionic	ISP
Igepal CA-720	Alkylphenol ethoxylate nonionic	ISP
Igepal CO-630/CO-660/ CO-710	Alkylphenol ethoxylate	ISP
Igepal CO-977	Water soluble surfactant (70%)	ISP
Isopar E/K/L/M/V	Isoparaffinic solvent	Exxon
Lanoquat 50	Quaternary product	Henkel
Lipoxol		Huls
Lipoxol 6000 & 12000		Huls
Lonzabac 12.30		Lonza
Lytron 295 Latex	Polystyrene emulsion	Morton
Kaopolite SF/1152/ 1168	Anhydrous aluminum silicate	Kaopol-
Kathon CG	Fungicide (Biocide)	Rohm&
Kelzan	Xanthan gum	Kelco
Kermac 600	Mineral seal oil	Kerr-Mc
Korthix Thixotropic Agent	Refined white bentonite	Kaopol-

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Mackadet 40K	Potassium coconut soap	McIntyre
Mackam JS	Low foam surfactant	McIntyre
Mackam MEJ	Amphoteric wetting agent	McIntyre
Mackam 2CSF	Surfactant	McIntyre
Mackam 2CYSF	Low foaming surfactant	McIntyre
Mackam 35	Cocamidopropyl betaine	McIntyre
Mackamide CD	Cocamide DEA	McIntyre
Mackamine C-10	Amine oxide surfactant	McIntyre
Mackamine L0	Amine oxide surfactant	McIntyre
Mackazoline O	Oleyl hydroxyethyl imidazoline	McIntyre
Mackstat DM	DMDM hydantoin	McIntyre
Macol 48	Block polyol	PPG
Macol LF-120	Rinse aid. MW: 1,000	PPG
Macol TD-3	Nonionic surfactant. HLB: 8.0	PPG
Macol TD-12	Nonionic surfactant. HLB: 14.1	PPG
Maphos 60-A	Phosphate ester	PPG
Marlamids	Fatty acid alkanolamides	Huls
Marlazins	Fatty amine polyglycol ethers	Huls
Marlinats	Fatty alcohol ether sulphates	Huls
Marlipals	Fatty alcohol polyglycol ethers	Huls
Marlons	Alkylbenzenesulphonates, sodium salts	Huls
Marlophors	Partial phosphate esters	Huls

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Marlosoft IQ 90	Quaternary imidazolines	Huls
Marlowets	Emulsifiers	Huls
Marlox's	Fatty alcohol alkylene oxide addition products	Huls
Mazamide 80	Specialty alkanolamide	PPG
Mazawet 36	Surfactant	PPG
Mazclean EP		PPG
Mazon 98	Proprietary surfactant	PPG
Medialan LD		
Methyl Carbitol Solvent		UnCarb
Metso Pentabead 20	Sodium metasilicate, pentahydrate	PQ
Miranol CS Conc.	Cocoamphopropylsulfonate amphoteric surfactant	Miranol
Miranol FBS	Surfactant	Miranol
Miranol JEM Conc.	Mixed C8 amphocarboxylate amphoteric	Miranol
Mirataine TM	Dihydroxyethyl tallow glycinate amphoteric surfactant	Miranol
ML-870 Latex	Acrylic polymer emulsion	Morton
Montan Wax "S"		Stroh-
Mor-Glo 2 Latex	Floor polish latex (38%)	Morton
Morton Conrez 510	Polymer emulsion	Morton
M-Pyrol	N-Methyl-2-Pyrrolidone	ISP

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Neodol 25-3 Ethoxylate	Linear primary alcohol	Shell
Neodol 25-3S	Ethoxysulfate. Sodium cation	Shell
Neodol 25-7 Ethoxylate	Alcohol ethoxylate. MW: 519	Shell
Neodol 91-8 Ethoxylate	Lineal primary alcohol. MW: 529	Shell
Ozokerite 170		Koster
PEG-10 Carnauba		Koster
Permulsin SP	Polycarboxylate	
Petro BAF Liquid	Anionic surfactant & dispersant	DeSoto
Betro BAF Powder	Anionic surfactant & dispersant	DeSoto
Petro LBA/ULF/22	Anionic surfactant & dispersant	DeSoto
Petro SXS-40	Sodium xylene sulfonate 40%	DeSoto
Prapagen WK		
Prifac 7976	Fatty acid	Unichema
Proxel GXL	Chemical biocide	ICI
Refined Concord Wax #407		Concord
Rewoteric AM B-15		Witco
Rewoteric AM KSF-40		Witco
Rewoteric AM V	Surfactant	Witco
Rhodacal A-246/L		Rhone-
Rhodacal DS-10		Rhone-
Rhodacal DSB		Rhone-

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Rhodacal IPAM		Rhone-
Rhodacal 330		Rhone-
Rhodafac LO-529	Phosphate ester nonionic	Rhone-
Rhodafac RA-600		Rhone-
Rhodafac RE-610	Phosphate ester anionic	Rhone-
Rhodapex CO-436		Rhone-
Rhodapex ES-2		Rhone-
Rhodapax MA-460		Rhone-
Rhodapex NA-61		Rhone-
Rhodopol 23		Rhone-
Rhodapon BOS		Rhone-
Rhodapon SB		Rhone-
Rhodapon UB		Rhone-
Rhodasurf BC-840	Ethoxylated tridecyl alcohol	Rhone-
Rhodasurf 25-7		Rhone-
Rhodasurf 25-9		Rhone-
Rhodasurf 91-6		Rhone-
Ross Micro Wax 1133/15W		Ross
Ross Ozokerite Wax 77Y		Ross
SAG 1010	Silicone antifoam	UnCarb
Sequion 10Na2	Phosphonate HEDP	
SF96(100)/SF96(350)/ SF96(1000)/SF 1705/SF 1706	Polydimethyl silicone fluid	GESil
Shellsol T	Isoparaaffinic solvent	Shell
SM 2109		GESil

RAW MATERIALS SM 2133/SM 2135	CHEMICAL DESCRIPTION	SOURCE GESil
Snow Floss Silica	Processed diatomaceous silica	Manville
Sokalan CP 5	Polycarboxylate	
Sokalan HP 22		
Sokalan HP 50	Polyvinylpyrrolidone	
Sokalan PA 40	Polycarboxylate	
Solvent BG		
Solvent GX 5		
Span 80	Surfactant	ICI
SR 107		
Star	Sodium silicate 42 Be'	PQ
Stepanol DEA (35%)	Diethanolamine lauryl sulfate	Stepan
Super Floss	Mineral filler	Manville
Surfonic N-95	Nonionic surfactant. HLB: 12.9	Texaco
SWS 211 Silicone	Antifoam	Wacker
Syntran 6520	Acrylic emulsion	Inter-
Technocell 90 DU		
Texstim 8741	Nonionic surfactant	Tomah
Thermphos NW		
Tinopal CBS-X	Fluorescent whitening agent	Ciba-
Tomah Alkali Surfactant: Amphoteric (35% Active)		Tomah
Tomah AO-14-2	Ether amine oxide surfactant	Tomah
Tomah AO-728 Special	Amine oxide surfactant	Tomah

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Tomah Emulsifier Four	Dialkyl quaternary surfactant	Tomah
Tomah Q-17-2		Tomah
Triethanolamine R		
Triton CF-10	Alkylaryl polyether nonionic	UnCarb
Tween 81	Surfactant	ICI
Tylose CBR 10000		
Ucon 11	Propellant	UnCarb
Ucon 12	Propellant	UnCarb
Union Carbide L-45, 100 cstks.	Silicone	UnCarb
Union Carbide L-45, 30,000 cstks.	Silicone	UnCarb
Union Carbide L-46	Silicone	UnCarb
Union Carbide LE-461	Silicone	UnCarb
Union Carbide LE-462	Silicone	UnCarb
Varamide A-83	Detergent alkanolamide	Witco
Varamide ML-1	Detergent alkanolamide	Witco
Varion AM-KSF-40%	Surfactant	Witco
Varonic K205/LI-48/ LI-67	Nonionic wetting agent	Witco
Varox 365	Wetting agent,degreaser,detergent	Witco
Varox 1770	Amine oxide	Witco
Varsol & Varsol No.2	Mineral spirits	Exxon
Veegum Pro	Complex colloidal magnesium aluminum silicate	Vander-

RAW MATERIALS	CHEMICAL DESCRIPTION	SOURCE
Versene 100/220	Solution of tetrasodium salt of EDTA	Dow
Vestinol C		Huls
Vestowax AW 1060	Wax emulsion, 15% basis	Huls
Viscasil 10,000/ 12,000/30,000	Silicone fluid	GESil
Volclay NF-BC	Western bentonite	AmColl
Wessalith P	Zeolith A	
Witcamide CDA/ S-771/128T/511/5195	Alkanolamide surfactant	Witco
Witco 1298 Soft Acid		Witco
Witcolate A	Sodium lauryl sulfate. Anionic	Witco
Witcolate AE-3/ ES-3/LES-60A/S-1285C/SE-5/WAC-LA/2310/7031	Sulfated surfactants	Witco
Witconate AOS/ SXS/30DS/45LX	Sulfonate surfactant	Witco
Witconate 1260 Slurry C-12 LAS (60%)		Witco
Witconol 14	Nonionic	Witco
Zeolith A		
#3 Carnauba		Koster
668 Polishing Powder		WhittCD
678 Polishing Powder		WhittCD
787 Polishing Alumina P-10 Feinst		WhittCD

Section IV

Suppliers' Addresses

Allied-Signal Inc.
P.O. Box 2332R
Morristown, NJ 07962
(201)-455-2000/(800)-526-0717

American Colloid Co.
1500 W. Shure Dr.
Arlington Heights, IL 60004
(312)-392-4600

Arco Chemical Co.
3801 West Chester Pike
Newtown Square, PA 19073
(215)-359-2000

BASF Corp.
100 Cherry Hill Rd.
Parsippany, NJ 07054
(201)-316-3000/(800)-526-1072

BP Oil Inc.
200 Public Square
Cleveland, OH 44114
(216)-586-6364/(800)-321-8598

Burlington Chemical Co., Inc.
P.O. Box 111
615 Huffman Mill Rd.
Burlington, NC 27215
(919)-584-0111/(800)-672-5888

Concord Chemical Co.
17th and Federal Sts.
Camden, NJ 08105
(609)-966-1526

Cytec Industries, Inc.
Five Garret Mountain Plaza
West Paterson, NJ 07424
(908)-862-6000/(800)-253-4078

DeSoto, Inc.
1700 S. Mt. Prospect Rd.
Des Plaines, IL 60018
(312)-391-9000

Dow Chemical Co.
Midland, MI 48674
(800)-258-CHEM

Dow Corning Corp.
Box 0994
Midland, MI 48686
(517)-496-4000

Eastman Chemical Co.
P.O. Box 431
Kingsport, TN 37662
(615)-229-2318/(800)-327-8626

Exxon Chemical Americas
13501 Katy Frwy
Houston, TX 77079
(713)-870-6000/(800)-231-6633

FMC Corp.
2000 Market St.
Philadelphia, PA 19103
(215)-299-6000/(800)-526-3649

ISP/GAF Corp.
1361 Alps Road
Wayne, NJ 07470
(201)-628-3000/(800)-848-7659

Genesee Polymers Corp.
Fenton Rd.
P.O. Box 7047
Flint, MI 48507
(313)-238-4966

GE Silicones
260 Hudson River Rd.
Waterford, NY 12188
(518)-237-3330/(800)-255-8886

BF Goodrich Co.
9911 Brecksville Rd.
Brecksville, OH 44141
(216)-447-5000/(800)-332-1144

Haarman & Reimer Corp.
P.O. Box 175
70 Diamond Rd.
Springfield, NJ 07081
(201)-467-5600/(800)-422-1559

Henkel Corp.
5325 S. Ninth Ave.
LaGrange, IL 60525
(708)-530-7300/(800)-543-7370

Hoechst-Celanese Corp.
26 Main St.
Chatham, NJ 07960
(201)-635-2600/(800)-526-4960

Huls America Inc.
Turner Pl.
Piscataway, NJ 08855
(201)-981-5000/(800)-526-0339

Interpolymer Corp.
330 Pine St.
Canton, MA 02021
(617)-828-7120/(800)-444-1281

Kaopolite, Inc.
2444 Morris Ave.
Union, NJ 07083
(908)-789-0609

Kelco Div.
Merck & Co., Inc.
8355 Aero Drive
San Diego, CA 92123
(619)292-4900/(800)-535-2656

Kerr-McGee Chemical Corp.
Kerr-McGee Ctr.
P.O. Box 25861
Oklahoma City, OK 73125
(405)-270-1313/(800)-654-3911

Koster Keunen Inc.
P.O. Box 447
90 Bourne Blvd.
Sayville, NY 11782
(516)-589-0456

Johns-Manville
Ken Caryl Ranch
Denver, CO 80217

McIntyre Group Ltd.
4851 S. St. Louis Ave.
Chicago, IL 60513
(312)-927-2401

Miranol Inc.
P.O. Box 436
Dayton, NJ 08810
(201)-329-3900

Mona Industries Inc.
76 E. 24 St.
P.O. Box 425
Paterson, NJ 07544
(201)-345-8220/(800)-553-6662

Monsanto Chemical Co.
800 N. Lindbergh Blvd.
St. Louis, MO 63167
(314)-694-1000/(800)-325-4330

Morton International Inc.
100 N. Riverside Plaza
Chicago, IL 60606
(312)-807-2000/(800)-367-3318

Petrolite Corp.
6910 E. 14 St.
Tulsa, OK 74112
(918)-836-1601

Pilot Chemical Co.
11756 Burke St.
Santa Fe Springs, CA 90670
(310)-723-0036

PPG Chemicals
3938 Porett Drive
Gurnee, IL 60031
(708)-244-3410/(800)-323-0856

PQ Corp.
P.O. Box 840
Valley Forge, PA 19482
(215)-293-7200

Rhone-Poulenc
CN 7500
Prospect Plains Rd.
Cranbury, NJ 08512
(609)-860-4000/(800)-626-2613

Rohm & Haas Co.
Independence Mall West
Philadelphia, PA 19105
(215)-592-3000

Ross Chemical Inc.
303 Dale Dr.
Fountain Inn, SC 29644
(803)-862-4474

Sandoz Chemicals Corp.
4000 Monroe Rd.
Charlotte, NC 28205
(704)-331-7078/(800)-631-8077

Shell Chemical Co.
P.O. Box 2463
Houston, TX 77252
(713)-241-6161

Stepan Co.
22 W. Frontage Rd.
Northfield, IL 60093
(708)-446-7500/(800)-745-7837

Strohmeyer & Arpe Co., Inc.
89 Milburn Ave.
Milburn, NJ 07041
(201)-761-7600

Texaco Chemical Co.
3040 Post Oak Blvd.
Houston, TX 77056
(713)-961-3711

Tomah Products, Inc.
1012 Terra Drive
Milton, WI 53563
(608)-868-6811/(800)-441-0708

3M
3M Center
St. Paul, MN 55144
(612)-733-5454

Unichema Chemicals, Inc.
4650 S. Racine Ave.
Chicago, IL 60609
(312)-376-9000/(800)-833-2864

Union Carbide Corp.
39 Old Ridgebury Rd.
Danbury, CT 06817
(203)-794-2000

RT Vanderbilt Co., Inc.
P.O. Box 5150
30 Winfield St.
Norfolk, CT 06856
(203)-853-1400/(800)-243-6064

Wacker Silicones Corp.
3301 Sutton Rd.
Adrian, MI 49221
(517)-264-8500/(800)-248-0063

Whittaker, Clark & Daniels, Inc.
1000 Coolidge St.
S. Plainfield, NJ 07080
(201)-561-6100

Witco Chemical Co.
5777 Frantz Rd.
P.O. Box 646
Dublin, OH 43017
(614)-765-6500/(800)-366-6500

Witco Corp.
520 Madison Ave.
New York, NY 10022
(212)-605-3941/(800)-634-4010

ADVANCED CLEANING PRODUCT FORMULATIONS

Volume 3

by

Ernest W. Flick

This book (Volume 3) presents more than 630 up-to-date advanced cleaning product formulations for household, industrial and automotive applications. It is the result of information received from numerous industrial companies and other organizations. The data represent selections made at no cost to, nor influence from, the makers or distributors of these materials. Only the most recent formulas have been included. All formulations are completely different than those contained in Volume 1 published in 1989 and Volume 2 published in 1994.

Formulation in the cleaning product industry has gradually been undergoing significant change during the past years. Raw materials costs have risen and manufacturers have been reluctant to pass along these increases. Environmental considerations have also played a part. By changing formulations to improve cost/performance characteristics, manufacturers have been able to control costs but still enhance performance. This book presents manufacturers' suggested formulations which might meet new performance criteria.

The formulations in this book are divided into the following sections and chapters, with the number of formulations indicated in ():

I. Household and Industrial Cleaners and Polishes

1. **Bathroom Cleaners (14)**
2. **Dairy Food and General Industrial Cleaners (52)**
3. **Degreasers (25)**
4. **Dishwashing Detergents (70)**
5. **General Purpose Cleaners (29)**
6. **Glass Cleaners/Polishes (18)**
7. **Hard Surface Cleaners (59)**
8. **Laundry Products (100)**
9. **Metal Cleaners and Polishes (52)**
10. **Oven, Grill and Hot Plate Cleaners (11)**
11. **Polishes, Coatings and Finishes (19)**
12. **Rinse Aids (5)**

13. Rug, Floor, Carpet, Upholstery Shampoos and Cleaners (41)

14. Miscellaneous (49)

II. Transportation Cleaners and Polishes

15. Auto Cleaners and Polishes (32)

16. Car and Truck Wash Compounds (34)

17. Whitewall Tire Cleaners (11)

18. Miscellaneous

Each formula is located in the chapter which is most applicable. The reader, seeking a formula for a specific end use, should check each chapter which could possibly apply. In addition to the above, there are two other sections which will be helpful to the reader.

III. A chemical trademark section where each tradenamed raw material included in the book is listed with a chemical description and the supplier's name. The specifications which each raw material meets are included, if applicable.

IV. Main office addresses of the suppliers of trademarked raw materials.

Each formulation in the book lists the following information, as available, in the manufacturer's own words:

- Description of end use and most outstanding properties.
- The percent by weight or volume of each raw material included in the formula, rounded to a decimal figure.
- Key properties of the formula, which are the features that the source considers to be more outstanding than other formulations of the same type.
- The formula source, which is the company or organization that supplied the formula. The secondary source may be the originating company and/or the primary source's publication title, or both. A formula number is included, if applicable.

ADVANCED CLEANING PRODUCT FORMULATIONS

Volume 2

by
Ernest W. Flick

This book (Volume 2) presents more than 800 up-to-date advanced cleaning product formulations for household, industrial and automotive applications. It is the result of information received from numerous industrial companies and other organizations. The data represent selections made at no cost to, nor influence from, the makers or distributors of these materials. Only the most recent formulas have been included. All formulations are completely different than those contained in Volume 1, which was published in 1989.

Formulation in the cleaning product industry has gradually been undergoing significant change during the past years. Raw materials costs have risen and manufacturers have been reluctant to pass along these increases. Environmental considerations have also played a part. By changing formulations to improve cost-performance characteristics, manufacturers have been able to control costs but still enhance performance. This book presents supplier's suggested formulations which might meet new performance criteria.

The formulations in this book are divided into the following sections and chapters, with the number of formulations indicated in ():

I. Household and industrial Cleaners and Polishes (733)

1. **Bathroom Cleaners (29)**
2. **Dairy and Food Industry Cleaners (15)**
3. **Degreasers (20)**
4. **Dishwashing Detergents (67)**
5. **Detergents/Disinfectants (36)**
6. **General Purpose Cleaners (47)**
7. **Hard Surface Cleaners (60)**
8. **Laundry Products (217)**
9. **Metal Cleaners (87)**
10. **Polishes, Coatings and Sealers (32)**
11. **Rinse Aids (6)**

12. Rug, Carpet and Upholstery Shampoos and Cleaners (21)

13. Miscellaneous Cleaners (96)

II. Transportation Cleaners and Polishes (76)

14. Auto Cleaners and Polishes (9)

15. Car and Truck Wash Compounds (38)

16. Whitewall Tire Cleaners (10)

17. Miscellaneous (19)

In addition to the above, there are two other sections which will be helpful to the reader.

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IV. Main office addresses of the suppliers of trademarked raw materials.

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